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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

OF LONDON.

OB TERRAS RECLUSAS.
ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

VOL. I.

SESSIONS 1855-6 and 1856-7.

Nos. I. to XI.

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ROYAL GEOGRAPHICAL SOCIETY,
15, WHITEHALL PLACE.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1855-6.

First Meeting, November 12, 1855.

Rear-Admiral F. W. BEECHEY, President, in the Chair.

Capt. R. Collinson, R.N., C.B.; *Mr. R. Anderson, Surgeon* R.N.; *the Rev. Brownrigg Smith,* M.A.; *and Thomas W. Laroche, Esq., were elected Fellows.*

Sir Roderick Murchison announced the recent erection of the obelisk on the quay of Greenwich Hospital to the memory of Lieut. Bellot, in the following terms:—

"Mr. President and Gentlemen,—To the assembled geographers who originated the subscription for the Bellot Testimonial, I beg to announce that an obelisk of granite has just been erected in memory of the noble-minded French officer who in the year 1853 perished amid the Polar ice whilst serving in the last British expedition that sailed in search of our illustrious member, Franklin. At the same time I have to inform you, that about 1500*l.*, the surplus of the subscriptions beyond the cost of the obelisk, having been already partially distributed, will shortly be entirely divided among the five sisters of the deceased.

"Not attempting on this occasion to give a sketch of the life of Bellot, I may be permitted to say, that whilst in his earlier naval services he gained the esteem of British sailors by his gallant co-operation, whether in the Rio de la Plata or in suppressing the African slave trade, he afterwards won the affection of all his associates during two perilous and adventurous voyages in search of our missing explorers. In short, the fortitude and daring he exhibited in moments of peril, and the benevolence which shone out in his bright but short career, were eminently calculated to rouse that warm and genial sympathy for his fate throughout Britain which the monument is destined to mark.

"*As Chairman of the Committee* appointed by the General Meeting of 1853, over which I had the honour to preside, let me inform you that through the hearty co-operation of Her Majesty's Government and partiality of the Admiralty, and the good will of the Governors of Greenwich Hospital, a site was obtained which testifies at once our gratitude and admiration; for the obelisk, designed by Mr. P. Hardwick, is erected on the bank of the river from which the young French officer sailed, in the 'Phœnix,' commanded by Captain Inglefield, and bears on its sides, which face the river and our great Naval Hospital, the honoured name of 'Bellot.'

"It having been resolved that a Cenotaph to the memory of Franklin and his companions is to be placed in the hall of Greenwich Hospital —which is held to be sacred to the memory of the noblest of our seamen—I am sure you will unite with me in rejoicing that the memorial to the young French officer should thus be raised in proximity to the tribute of national regard which is paid to our lamented Polar heroes.

"It must further be highly gratifying to all members of the Royal Geographical Society to see that our efforts to do justice to a French officer have been duly appreciated in his native country, as testified by the presence on this occasion of Count de Persigny, the Ambassador who worthily represents a Sovereign gifted with extensive geographical knowledge, and who has himself taken a deep interest in British Polar expeditions. If Englishmen, to their credit, willingly came forward to manifest their sense of the noble bearing of a young Frenchman, let them remember that France, ever prompt to reward her own brave sons, had also her testimonial; and that the Emperor Louis Napoleon assigned from his own purse a pension to the family of Bellot.

"May, then, the monument, which was erected at the call of the Royal Geographical Society in honour of the young Frenchman, be, for ages to come, a symbol of the union of the two countries in the cause of humanity, and for the advancement of our science."

The Count de Persigny, the French Ambassador, then rose and replied—

"Monsieur le Président,—Permettez moi de remercier Sir Roderick Murchison de ce qu'il vient de dire en faveur de l'Empereur et de la France. Le sujet dont il vient de vous entretenir m'a vivement intéressé. Ce que j'admire dans cette circonstance ce n'est pas seulement le dévouement de M. Bellot au milieu des plus rudes épreuves, mais c'est par-dessus tout, la sympathie que sa mort a excitée dans toute l'Angleterre. Le spectacle extraordinaire d'une grande nation pleurant sur la tombe d'un simple officier Français a profondément touché les cœurs du peuple Français; cette circonstance a plus fait pour fortifier l'alliance des deux pays que les calculs de la politique; et c'est un grand honneur pour votre Société d'avoir ainsi provoqué une démonstration qui a si fort contribuée à l'union des deux peuples."

Captain Washington, R.N., Hydrographer to the Admiralty, said—

"I need hardly say with what gratification, in common I am sure with all here assembled, I have listened to the eloquent words of the French Ambassador, and I can truly testify that his Excellency's sentiments are shared by more than one eminent person of his nation. It is scarcely a month since I had the honour of an interview with Admiral Bruat, Commander-in-Chief of the French fleet in the Black Sea, and while talking to him on board the 'Montebello,' his flag-ship, lying off Sebastopol, he expressed the very same feeling at the lively sympathy which the death of Bellot had caused throughout this country, and a similar hope that it might be the means of cementing the alliance between our two nations. Most cordially do we join in that hope.

"And while on the subject of Arctic discovery, I may mention, as a singular coincidence, that at one o'clock this day the Admiralty received a telegraphic communication from Aberdeen, stating that Capt. Kellett's vessel, the 'Resolute,' which was abandoned in the ice on the 1st of August, 1854, had drifted out to Davis's Straits, 1200 miles from the spot where it was originally left. The vessel had been taken possession of by an American whaler."

The Papers read were—

1. *On the Australian Alps.* By Dr. Müller.

Communicated by the Colonial Office.

Leaving Melbourne on the 1st of November, I travelled through the Ferntree Gullies to the Latrobe River, and thence to the Avon, and ascended Mount Wellington from the ranges of the latter stream on the 14th of November. The altitude of this mountain appears to me more than 5000 feet, a snow-storm lasting here, even at so advanced a season, for a whole day. The main journey to the central part of the Australian Alps I commenced again from the Avon on the 22nd November, proceeding to the Mitchell River, and thence to the Dargo. Following along the scrubby ranges between this river and the Wentworth, I crossed the dividing range between the waters of Gipps' Land and those of the Murray River near the upper part of the Cabongra. Thence I traversed a grassy table-land in a north-easterly direction along the Cabongra downward, until the country appeared practicable, towards the N., to reach the highest part of the Bogong Ranges.

The ranges hereabouts, which never before have been traversed by civilized men, are generally fertile, and timbered with the mountain white gum-tree (Eucalyptus phlebophylla).

On the 3rd December I ascended the south-eastern of the two highest mountains of the Bogong Range. In its upper regions even the vegetation of bushes ceases, the slightly arched summit being covered with Alpine grasses and herbs. About noon I ascertained the boiling water point to be 198° according to Fahrenheit's thermometer, and 75° according to Reaumur's scale. I am at present unable to calculate from this the barometer height and approximative altitude of this mountain, but I believe that it will be found nearly 7000 feet above the level of the sea. The much more abrupt and yet higher summit of the north-western mount I ascended from the Upper Mitta Mitta, which skirts its base, on the 6th December. The boiling water point I observed again to be 198° F. (although the elevation of this mountain is unquestionably higher to the extent of several hundred feet), a circumstance owing to the greater atmospherical pressure of that day. The observation was instituted during the afternoon, about three o'clock. On both these mountains mighty masses of snow lay far below the summits, lodging chiefly in the ravines, and these never melt entirely under the heat of the summer sun.

Considering that mountains of such altitude, probably the two highest in the Australian continent, deserve distinctive names, I solicit his Excellency's permission to name the grandest of both Mount Hotham, and the second in height Mount Latrobe,—as I trust to be entitled to the great honour of being the first man who ever reached these commanding summits of the Australian highland. The sky being fortunately clear during the ascent of Mount Hotham, I enjoyed a most extensive and unrestricted view over the Alps, and I did not lose this opportunity of taking bearings over to some of the principal mountains already included in the trigonometrical survey of Australia. From Mount Hotham bore Mount Aberdeen (the southern peak in the Buffalo Ranges) W. 10° N., the most northern peak of the same range W. 30° N., Mount Buller W. 35° S., Mount M'Millan (of Townsend, or Castel Hill of Tyers) due S., the Cobboras mountains (between Omeo and Maneroo) E. 12° N., Mount Wellington S. 10° W., Mount Latrobe (distant about 8 miles) S. 25° E. Farther bearings were made to Mount Leichhardt E. 30° N., to Mitchell's Plateau (in about equal distance with Mount Buller) S. 40° W., to Kennedy's Height (a rocky hill in the snowy table-land, and about 6 miles distant) E. 5° S., to Hooker's Plateau (about 15 miles distant) N. 25° E. The bearings from Mount Latrobe were as follow:—Mitchell's Plateau S. 15° W., Mount Aberdeen W. 5° S., Clarke's Peak (between Mitchell's Plateau and the Buffalo Ranges) S. 30° W., Mount Hotham N. 25° W. Mounts Buller, Wellington, M'Millan, and other mountains, were concealed in clouds. I hope that these bearings, although only taken with a simple pocket compass, will be found sufficient and correct enough to fix the position of these mountains until an exact survey of this interesting part of the country shall be performed. The signification "Bogong Range" ought to be abandoned, as the natives apply it to any of the lofty mountains when in the fissures of the rocks, chiefly when covered with the spreading Alp pine (Podocarpus montana), the Bogong moth occurs. One of the main branches of the Mitta Mitta has its sources at Mount Latrobe, and those of another, as well as those of the Ovens and Mitchell, lie in a lower range not far distant. This snowy highland is in many places well grassed, and the lower parts of it will be doubtless occupied as cattle runs as soon as the discovery of a workable gold-field opens this part of the colony. The prevailing rock is sandstone, often accompanied by slate and quartz. Granite is comparatively rare.

After extending my journeys over several mountains in the neighbourhood, and an exploration of the Upper Mitta Mitta, I went over a generally fertile country to Omeo.

The amount of additional plants for the Flora of Victoria, obtained during this part of my expedition, is nearly sixty species. Several of them are perfectly unknown, and nine of the genera and one natural order (Asteliaceæ) were previously also not represented in this colony.

It is my intention to proceed without delay from here to the Cobboras, thence to Maneroo and the Mungang Mountains, by which excursions the botanical examination of the Australian Alps will be completed.

2. *Extract of a Letter from the* Rev. W. B. CLARKE, F.R.G.S., *to the Secretary.*

St. Leonard's, N. S. Wales, June 1, 1855.

I HAVE had a conversation with Mr. Baines, the artist to the North Australian Expedition, and have recommended him to visit several places in this part of the colony, that he may be able to recognize similar formations in the N. W., and I will give him every information in my power to assist his views. I think it a pity that *two* of the party (in case of the artist's death) had not been familiar with the use of the photographic apparatus.

We have had a very unusual season, and all the phenomena indicate a *period* in the climate. The ice has reached a lower latitude than ever was known, and the sea has been blocked up with it. In 1854 I wrote a note to Captain Hall of the 'Crœsus,' and also informed the Captain of the 'Lady Jocelyn' of the necessity there would be for caution respecting ice. I founded my expectations upon certain calculations from observed phenomena during long antecedent periods, and I find they were correct. Presuming upon the idea of periodical affections of the earth's general organism (a question which I took up many years since in Loudon's Mag. Nat. Hist.), I imagine the cold of your last English winter was connected with the disengagement previously of ice from the Arctic coasts, as our cold here in 1854 was, doubtless, with that of the ice from the Antarctic shores.

---

3. *Extract of a Letter from* Capt. STURT, F.R.G.S., *to* Dr. SHAW.

Cheltenham, Oct. 22.

BY the last mails I received letters from Messrs. Gregory and Baines, of the North Australian Expedition, and I therefore lose no time in letting you know how the Expedition is getting on. The whole of the staff were to leave Sydney on the 15th of July for Moreton Bay, where the younger Mr. Gregory has been for some time employed organising the party and purchasing stock. Mr. Gregory writes to say that as he feared the prevalence of the poisonous herb "Lobelia" in the northern parts of the continent, he had decided in taking all horses, 50 in number. Two vessels convey him and his party to the Victoria, and he proposes, as I suggested, trying to penetrate into Central Western Australia, and then returning to the Victoria for fresh supplies, which, under the change, is all right. He will then cross to the Gulf of Carpentaria and try to unite his own line with that of Mitchell's Victoria; but the truth is, his movements will depend on what kind of country he may find, and we shall have intelligence of him before he commences the second portion of his journey.

I suppose the Expedition is now high up Stokes's Victoria, and we may soon learn how and with what prospects they left the coast. I shall watch their progress with intense interest, and you may depend on it I will let you know everything that I hear.

Sir R. Murchison, in referring to the interest the Society had taken in originating and promoting this Expedition, pointed out its proposed course from Moreton Bay by sea to the mouth of the Victoria River on the North-West Coast. It was intended to ascend that river to its *source, and to determine the* boundaries of the tract of land whose drainage formed the rivers of North Australia. The expedition, passing eastward, would probably skirt the northern limits of Sturt's Central Desert, and reach the head waters of the streams that flow into the Gulf of Carpentaria; from thence it was hoped that it would be in a condition to penetrate southwards, to the great bend of the Barcoo River; which was the northernmost point reached by Sir Thomas Mitchell and Mr. Kennedy on their journeys from Sydney towards the Gulf of Carpentaria. These operations would greatly extend our knowledge of Northern Australia, and tend to open up communication between it and the Southern colonies.

4. *Letters from Africa, accompanied by a new Map of the Interior.*

By Dr. Livingston.

Communicated by Sir Roderick Murchison.

These letters of Dr. Livingston, including his observations and map, will be found printed at length in vol. xxv. p. 217, of the forthcoming Journal of the Royal Geographical Society. A short abstract will therefore suffice:—He left the confluence of the Leeba and Leeambye, lat. 14° 11′ S. and long. 23° 40′ E., to travel to the west coast of Africa. Sekeletu, the king of that country (under whose protection he had been long exploring), furnished him with 27 men and with oxen; and Dr. Livingston proceeded by the way of Londa, whose king, Matiamvo, is well known to the Portuguese. Many flooded rivers and plains were crossed by the party, and at lat. 10° 17′ S. they forded the Casai River, having entered upon a new river system. The Londa country is forest land, alternating with sward. The trees are interlaced with creepers, and covered with mosses and lichens. Everything indicated a humid climate. Thence they passed to an elevated table-land, overgrown with Cape heaths and rhododendrons, and finally arrived at a sudden descent of 2000 feet, at the foot of which lay the wonderfully fertile valley of the Cassangé and the river Quango: 90 or 100 miles to the W. of this descent appeared the edge of a similar table-land, but looking in the far distance like a range of mountains. The tribes were found to alter for the worse as the Portuguese territories were approached, and heavy fines were levied on the Doctor's party upon the most frivolous pretences, but actual collision was avoided. Once within the Portuguese territories, he pays full tribute to the courtesy and kindness he experienced at the hands of the authorities and others. He arrived at Loanda labouring under severe illness, having suffered very frequently from intermittent fever. He adds that the Casai and Quango are reported by intelligent natives, who profess knowledge of the country and who are believed by

Portuguese traders, to join somewhere N. of Cassangé, and to form the Congo or Zaire of Capt. Tuckey. Dr. Livingston announced his intention of returning to the interior and of visiting King Matiamvo, and subsequently of descending to Quillimane, on the E. coast of Africa, by the Leeambye River (which, he entertains no doubt, is identical with the Zambesi). Dr. Livingston did so return, and writes from Cassangé, describing the province of Angola, through which he had then passed twice.

After some remarks from Mr. Macqueen, and a few words from Sir R. Murchison, Mr. Consul Brand, and Mr. Galton, the Meeting was adjourned till November 26.

Second Meeting, November 26, 1855.

SIR RODERICK MURCHISON, V.P., in the Chair.

George Peabody, Esq.; Captain E. G. Fanshawe, R.N.; *Colonel C. G. Fagan; Dr. Christopher Elliott,* M.D.; *Captain E. Palmer,* R.A.; *the Rev. J. L. Porter,* A.M.; *Edward Cheshire; Edmund Gabriel, Her Majesty's Arbitrator at St. Paul de Loanda; G. F. Leslie; W. E. Shaw,* R.N.; *W. Spottiswoode,* F.R.S.; *George Milner Stephen,* F.G.S.; *and James Vavasseur, Esqrs., were elected Fellows.*

The Papers read were—

1. *Memoir on the Map of Damascus, the Hauran, and the Mountains of Lebanon, constructed from Personal Survey.* By the Rev. J. L. PORTER, A.M.

Communicated by JOHN HOGG, Esq., M.A., F.R.S., F.R.G.S.

This paper contains the account of a great many journeys, taken by the author, in various directions about Syria, during which he made a large number of observations with rough surveying instruments, and records many gross errors which he is satisfied that he has detected in the received geography of that country. The environs of Damascus he finds to be very untruly delineated: thus the Bahr el Merj is not one single lake, but three distinct ones, and the plain surrounding the city is studded with large villages, none of which appear on the maps. Balbeck is to the eastward of N. from Damascus, and not considerably to the westward of N. The end of the Antilibanus chain requires a correction of half a degree in longitude and a quarter of a degree in latitude. The author traversed the whole region between the Hadj road and the borders of the desert in such a way as to enable him to cover it with a network of compass bearings, embracing all the more important towns and villages; and these he connected with the well-defined summits of Hermon and Mânia.

Several minor faults in Burckhardt are pointed out, and some conclusions of M. de Saulcy contended against. Allusion is made to a recent map of the Hauran by a Turkish officer of Engineers, Fezzy Bey, which was found to contain much useful matter, though not strictly accurate as a survey.

Mr. Porter conceives that the whole range of Gebel Hauran, and not the single peak of Kuleib, is the ancient Alsadamus Mons; and as the district which comprehends this mountain range is now called "Ard el Bathanyeh," and for other reasons, he considers that this province is identical with the ancient Batanea.

2. *Reports respecting Central Africa, as collected in Mambara and on the East Coast, with a new Map of the Country.* By the Rev. JAMES ERHARDT.

Communicated by the CHURCH MISSIONARY SOCIETY.

Vague reports have long since been heard by the missionaries in Eastern Africa, of lakes; of mountains, isolated and in masses; and of a country whose slope and drainage was towards the interior.

At Mombas, few opportunities offered themselves of meeting with travelled natives; but it was quite otherwise both at Faga and at Tanga. At both of these places the missionaries stayed many months, and made acquaintance with caravan leaders, Arabs, Suahelis, ivory-merchants, and slave-dealers, whose reports corrected and corroborated what had been told to them before.

There are three main sets of routes from the coast to the interior, all of which pass over a flat country, and finally lead to an immense lake of fresh water. Mr. Erhardt calls this the "Sea of Uniamesi," from the country that affords the greatest extent of its eastern shores. But the Waniamesi, the inhabitants of that country, call it "Ukerewe;" elsewhere it is called "Niandja," and its southernmost extremity "Niassa."

Very full geographical details are given in Mr. Erhardt's paper about each part of these routes. He gives us also an account of its ferries, where it is narrow, and of two voyages across it, where it is very broad; one of these is that of an Arab, who also coasted along a large part of its northern shores.

The routes are as follows, and all of them run westerly and in the *directions drawn* by him on the accompanying diagram-map.

1st. That of the ivory traders from Tanga, who, threading various isolated masses of hills, of which Kilimandjaro and Doenyo Engai are snow-capped, passes through the level pastoral country of Masai to a place called Burgenei. This route (taking the average of four journeys, the particulars of which are given) occupies 55 days, the rate of travel being about seven hours a day. His informants travelled 8 days farther from Burgenei, through a tract peopled densely with Waniamesi; and then came suddenly upon the lake. The Masai are fierce and pastoral, the Waniamesi kind-hearted and agricultural.

2nd. That from Mboa Maji to Ujigi, a town of Uniamesi. This is of equal length to the first route, and is travelled leisurely by numerous caravans, with horses, donkeys, &c., for slaves, ivory, and copper ore. The country passed over is perfectly level, with the exception only of a mass of hills, the Ngu, which has to be crossed about a quarter of the way from the coast.

3rd. Those from Kiloa or Kirimba, to the ferries Gnombo and Mdenga. They are travelled by Portuguese slave dealers as well as by Arabs.

In tracing the contour of the lake, he begins from the South; he speaks of people who come up from its shores two days' journey to the southwards of the ferry Mdenga (which is stated to be due west of Wuibu), in order to cross the lake, for they know nothing of its southern termination. From Mdenga to Gnombo is 5 days—2 hard days farther to Sigono, a "heel." Here the shore of the lake makes a great *heel* and turns to the westward of North, for 7 days, when a wild elephant-country is reached. The shore now runs due west for 6 days to the Waniamesi. Among them for 12 days farther, the shores run due E. and W., and in another 12 days farther, a tribe, the Wafipa, is reached, in whose country is a small salt-water stream, of which much notice is taken and which is spoken of as running westwards from the Wafipa to the Wapogo.

A traveller from Ujigi, going due south along the shores of the lake, reached the salt river in the Wapogo country in 7 days; here, he says, the sea made "quite a round bend." This great bend is confirmed by fishermen of the Lake. From Ujigi northwards to the great river of the Wadusi, was sailed by an Arab, but detailed itineraries are wanting. A considerable portion of its southern and western shores is traced out on similar evidence.

Ujigi is the starting point for large row-boats to cross the lake to the opposite shore; in 5 days' rowing they reach a mountainous island, Kavogo. 25 more days takes them to the opposite shore, where they buy copper. The abovementioned Arab sailed across the sea in 12 or 15 days, and was 9 days in returning.

The Lake appears to be remarkable for its low, sandy, and reedy shores, except only at its southern extremity, where it runs along the base of a steep range of hills. Its waves run very high, and an entirely calm day is rare. Its water is sweet and good, and abounds with fish; there are very few islands visible anywhere from the coast, and the abovementioned Arab, who twice crossed it, saw none. A large part of its shores teems with a population "like an ant-hill." Its northern extremity is unknown, but it may be at the foot of a range of mountains which stretch westward to the north of Burgenei. The river of the Wadusi, on the northern part of its east coast, is an enormous river, but very sluggish; the other principal tributaries which have been heard of, are laid down on the accompanying map.

Third Meeting, December 10, 1855.

Rear-Admiral F. W. BEECHEY, President, in the Chair.

John Alger, A. Cumming, A. Gillespie, D. MGregor, and C. White, Esqrs., were elected Fellows.

The President stated that the Secretary had received a communication from Mr. Haidinger, of Vienna, announcing the proposed formation of a Geographical Society in Austria.

The Papers read were—

1. *Extracts from a Letter from* John Kent, Esq., f.r.g.s., *to* Dr. Shaw, *dated Sydney, Aug.* 12, 1855, *giving information respecting the North Australian Expedition.*

"I left Moreton Bay on the 4th inst., at which time the expedition was lying at the bar of the river, waiting for the tide to proceed to sea. It consisted of Mr. A. C. Gregory and his brother, Messrs. Baines and Wilson, Mr. Elsey, the surgeon, Dr. Müller, Mr. Flood, and 14 men, with 50 horses and 200 sheep, embarked on board the 'Monarch' barque and schooner 'Tom Tough.' Mr. G. Windsor Earl is also a passenger on board the former vessel, and his experience in tropical Australia will be of great value to the expedition. The 'Monarch,' after landing the horses and stores, proceeds to Singapore, from whence you will next hear of its movements. The 'Tom Tough' is engaged to wait in attendance on the expedition so long as Mr. Gregory shall require her to do so. Provisions and stores for two years have been provided, and all Mr. Gregory has demanded supplied. The men have been engaged at 8*s*. per diem.

"There has been, in my opinion, one grave departure from the original plan, namely, the omission of bullocks and bullock drays, which I hold to be essentially necessary; but Mr. Gregory acts from his experience in West Australia, setting at nought the practice of Sturt, Mitchell, Leichhardt, and former explorers. Apart from this determination, which I hold to be an error, I deem him a most competent leader for such an expedition. Spare and active in person, quiet and reserved in manner, with great firmness of purpose, he is well adapted to conciliate the Aborigines, and, what is more essential, the elements composing his own party. I think it would be difficult to find four men better adapted for undergoing fatigue than the brothers Gregory, Wilson and Baines. Of the others I cannot speak so confidently; but the patience and resignation of Dr. Müller have been tested by a seat for three days up a gum tree, waiting the subsidence of a flood. He is a German botanical enthusiast, which will account for this incident in his experience.

"Authentic information has been received within a few weeks, which sets at rest the question of Leichhardt being alive. Several mules have been found which belonged to the party, and the remains of pack-saddles, broken and destroyed by the natives. There is no doubt, therefore, that he and his party have been cut off by the natives."

Sir Roderick Murchison, recapitulating what he had stated on previous occurrences, reminded the Meeting of the origin of this Expedition, as suggested by the Royal Geographical Society, and of the deep interest taken in it by the Duke of Newcastle, its first patron. He congratulated those who had united with himself in originating it, on the safe arrival and prosperous landing of the party under the able conduct of Mr. Gregory; and felt assured that every member of the expedition, as well as his geological correspondent, Mr. Wilson, was well qualified to perform the arduous task set before them, and the plan of which had been so ably matured by Captain Sturt.

2. *A communication from* Edmund Gabriel, Esq., *Her Majesty's Arbitrator at Loanda, to the* Earl of Clarendon.

Transmitted to the Society by Lord Wodehouse.

A letter to the same effect, dated August 28, had also been received through Consul Brand, announcing the receipt of a letter from Dr. Livingston, describing his further progress in the interior after leaving Cassangé. Dr. Livingston crossed the boundary of the province on the 18th of May last, intending to visit Matiamvo, the paramount chief of the Londa country, and to ascertain if the river Casai be navigable there. After crossing the river Chikapa and the river Maomba he arrived at Cobango, a large trading station on the river Chihombo, from whence Matiamovo is 100 miles E.N.E. At this place Dr. Livingston's native companions expressed an anxious wish to turn south towards their homes on the Leeambye; and circumstances rendered it necessary to adopt that course.

3. *Notes on the Geography of Central Africa from the researches of Livingston, Monteiro, Garcia, and other authorities.* By James Macqueen, Esq., F.R.G.S.

Mr. Macqueen called in question the conclusions of Mr. Erhardt.

In Mr. Macqueen's paper, of which only a small portion was read, he contended that there were two lakes, and not a single large one; that there was a general slope of Africa from the interior towards the coast of Zanzibar; that the river crossed by Dr. Livingston, and called by him the Casai or Cassabe, was not, as he had heard, an affluent of the Congo, but that it was identical with the Cassabe River, which joined with the Lualaba River and ran into the northernmost lake. That a river issued on the opposite side of this lake, and reached the sea under the name of the Lufia, or the Lufigi; that the Luapula River, passing near to Luenda, ran between the two lakes without touching either, and then joined the Lufia; and, finally, that the northernmost lake and the southernmost were distinguished by the names of the Greater and the Lesser Niandja.

Mr. Erhardt premised that, during his residence of six years on the coast, he had become familiarly acquainted with three of the native languages, and had derived his information from a vast number of persons, and from independent sources. He then recapitulated the conclusions he had arrived at, based on the evidence mentioned in his paper read at the last Meeting:—

That a ridge of considerable elevation, but not quite continuous, runs from N. to S., at no great distance from the coast, and forms the watershed of that part of Africa.

That the region to the E. of this ridge is drained by several short streams, *e. g.* the *Rufu*, rising in the *Faga* country; the *Rufuma*, and others.

That he himself had ascended the *Lufigi* river for a few miles, and found it to be a small and insignificant stream. Mr. Macqueen's description of its length and breadth corresponded to no river at all in East Africa.

That the country W. of this ridge consists of extensive plains with isolated hills, the plains being for the most part level, and presenting from the heights the appearance of a vast sea.

That beyond these there is an immense lake or inland sea, of which only the approximate size can be given, since the measurements are determined exclusively by the journeys made by natives along parts of its shores and across it. Only the E. and part of the S. coasts can be laid down with anything like an approach to accuracy.

He then mentioned the reports of natives and traders which connected different points in succession along the entire margin of this Lake, and asserted that he was well acquainted with the names given by Mr. Macqueen, and ascribed by him to different lakes, but that they simply referred to two reaches at the very southernmost extremity of the same lake: the lesser one, which ran N. and S., being usually ferried across by traders; and the greater one, running E. by W., seldom if ever crossed by them, because of its greater breadth, and because the direct routes of the caravans ran alongside of it.

4. *Geographical Notes on Siam, with a new map of the lower part of the Menàm River.* By Harry Parkes, F.R.G.S., *H.B.M.'s Consul at Amoy.*

Mr. Parkes commenced by alluding to the treaty lately concluded by Sir John Bowring with Siam, which has brought that country into prominent notice, and entered at length into the history, political divisions, and geography of Siam. For the map which accompanied the description he was indebted to the kindness of Dr. S. R. Honse and his colleagues of the United States mission.

The kingdom of Siam may be described generally as lying between 5° and 21° N. lat. and 98° and 105° E. long., but its eastern boundary is almost entirely unknown. It comprises—

1. Siam proper, divided into 41 provinces, each governed by a mandarin of the first class.

2. Tributary Malayan States on the south, whose submission is rather loose, and consists in sending an embassy once in three years to the Siamese Court with a tribute composed of a gold or silver tree, and in being bound to furnish men, money, and provisions when Siam is at war.

3. Conquered territory of Camboja and Korat on the east.

4. Tributary Lao states on the north and north-east.

Camboja, three or four centuries ago, was much more powerful than either Siam or Cochin China, but it has gradually been encroached upon, so that it is now reduced to a mere shadow of its former greatness, containing only half a million of inhabitants, while the son of their king is a hostage at Bankok, and the Cochin Chinese possess the exclusive navigation of the river of Camboja, the Mekong.

The Lao states furnish a very interesting people, whose ancestors appear to have formed the parent stock of the Siamese. Thus, the Laos call themselves the "Elder *Tai*;" and the Siamese the "Younger *Tai*." *Lao* is a Chinese word, and means "*Ancient*." When the Siamese separated themselves from the Laos, they became a tributary *province to Camboja.*

Mr. Parkes notices especially two of the Laos races, viz. the *white-bellied* Laos, who do not tattoo; and the *black-bellied* Laos, so called because they tattoo themselves with figures of tigers, dragons, and all kinds of monsters.

The rivers are the highways in many parts of Siam, and canals are very numerous in the S. portion. A large part of the country is inundated in the wet season, and then boats do not confine themselves to the canals, but sail over the rice-fields. The productions of Siam are very various, but the chief are rice, indigo, maize, sugar, cotton, pepper, lac, gums, &c.

Bankok, the capital, is situated on the lower part of the river. The houses are mostly built of teak, and the temples are very numerous. Several of them are very large, containing from 50 to 100 priests in each. Ayuttaya, the former capital, was situated on an island 14° 20′ N. lat. It covered the whole island. There were formerly many colossal idols, the cost of which may be estimated when it is stated that 25,000 lbs. of copper, a large quantity of silver, and 400 lbs. of gold were consumed in making one idol. The modern town contains floating houses, like those at Bankok. The population of Bankok is variously estimated from 350,000 to 400,000, and of these about one-third are Chinese. The city extends about 7 miles along both banks, having a breadth almost as great in one part. There are walls round portions of it, 30 feet high and 10 feet thick. Its temples are covered with coloured tiles, and are profusely gilded. Fruit-trees may be seen in every direction. The floating houses extend some distance from the banks of the stream.

Mr. Crawfurd expressed his satisfaction at the notes Mr. Parkes had put together. He said that a large part of Siam was a mere wilderness, and that not more than one-fifth of the whole territory was cultivated. The inundations referred to by Mr. Parkes might be very well compared to those of the Ganges; except that in the case of the Menàm the lower valley was not inundated more than 10 leagues counting from the sea, as the ground was high. Bankok, the capital, stood on this high ground. The bar at the mouth of the Menàm was 10 miles broad, having 2 feet of water upon it at low water, and 14 feet at high water. The climate of Siam was very good, and that of the S. part extremely healthy. Siam is emphatically a sugar-producing country; it is also the only country that produces *gamboge*, which derives its name from Camboja. Some kinds of fruit which grow here luxuriantly can scarcely be grown in any other part of Asia.

Mr. Simmonds, in confirmation of what Mr. Crawfurd had just stated, said that in 1845 no less than 340,000 cwt. of sugar were exported. The list of valuable products of Siam might be very greatly extended, as the *raw produce* from the extensive forests of Siam is very great. He would mention especially gum benzoin and *lac*. He regretted to find that the Americans had been before us in the trade with Siam.

In answer to a question put by him, Mr. Parkes stated that according to the treaty with the King of Siam, the British may travel and trade throughout the country, but they may only settle and purchase land for the distance of 54 miles round Bankok. English ships enter the rivers on the same standing as native craft. The free use of the Christian religion is allowed, together with churches, cemeteries, &c. The former heavy measurement duty is abolished, and one of 3 per cent. on imported goods and 6 or 7 per cent. on exported is substituted. Thus there is every reason to believe that the trade which under the former oppressive duties reached half a million sterling, may yield several millions annually.

The Meeting was then adjourned till January 14, 1856.

Fourth Meeting, January 14, 1856.

Rear-Admiral F. W. BEECHEY, President, in the Chair.

Sir Thomas Fremantle, Bart.; John Bowman; Alexander Gordon, C.E.; *J. W. Gordon,* F.S.A.; *H. S. Montagu, and John Phillips, Esqrs., were elected Fellows.*

The Papers read were—

1. *Translation of Three Letters from Dr. Vogel, addressed to Dr. Barth.*

Communicated by the Foreign Office.

The first letter was dated Jan. 30, 1855, from Gugeba, a town of about 3000 inhabitants; the second, Feb. 16th, from Yakoba; and some of the information they contain has already been published. In them he announces the following provisional determinations of latitudes and longitudes. The former of these may be depended on to 2 minutes, and the latter to 5 minutes. He mentions that a great many observations have been taken, but that they are not yet worked out.

	Lat. N.	Long. E. Green.	Mag. Var.
Yakoba, capital of Bautshi . .	10° 17′ 30″	9° 28′ 0″	
Gujeba	11 29 40	11 39 0	15° 14′ W.
Gabbei, frontier town of Borno	11 4 10	11 20 0	
Gombé, a town the size of Kuka	10 49 0	10 16 0	

Dr. Vogel bears a high tribute to the accuracy of Dr. Barth's rating.

The third letter contains more recent accounts; it is dated Gombé, June 5, 1855. Dr. Vogel and Maguire had both been very unwell in the neighbourhood of Yakoba, a town larger than East and West Kuka together, situated on a rocky plateau in a bare and stony district. He had thence endeavoured to penetrate to Adamaua, and in doing so crossed the Benue at the point where the steamer had anchored; of which fact "numberless empty pickle-jars and brandy-bottles gave unmistakeable proof." Next he arrived at Tindang, where the accident of a pack-horse being hurt fortunately prevented him joining a party of 50, who endeavoured to force the road to Yola, which had been stopped by the Bashama. All but two of these were killed the same day. Thence he returned to Gombé. He has left letters, in case another steamer should be despatched up the Tshadda.

At the request of the President Sir R. Murchison introduced to the Meeting a proposal of Dr. Baikie's to extend discovery up the Niger and Chadda. He said that, being as zealous as ever in the cause of African discovery, it gave him pleasure to be the means of bringing a proposal before the Society which embraced not only the extension of commerce, but of Christian philanthropy and of scientific knowledge. It was believed that the powerful Sultan of Sakatoo, whose influence extended over all the Fellatah tribes, would give his cordial assistance to an annual or triennial expedition sent for these purposes, and that, if recommended by the Society, Her Majesty's Government, and especially Lord Clarendon, would, it was hoped, countenance and support it.

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2. *Abstract of a Letter from Lieutenant Maury, U.S.N. Observatory, Washington, December 3rd,* 1855, *addressed to the President.*

Lieutenant Maury encloses a tracing of the track of the U.S.S. 'Vincennes,' under Commodore John Rogers, commanding the surveying expedition to the North Pacific Ocean. That officer states that he visited and ascended Herald Island in 1854, and thence sailed either over or in the immediate neighbourhood of several localities where land had been reported to be seen, but without finding any. Of these he specifies as follows,—that, by Captain Kellett, to the eastward and in the neighbourhood of Herald Island, the northern portion of that land mentioned in Arctic Papers 1847-51, p. 41; and the so-called Plover Islands; also that land which has been reported by Admiral Wrangel on native authority to lie to the N. of Cape Jakan.

Full official reports are expected from the Commodore, who is now at San Francisco.

The President remarked that Captain Kellett had not spoken of an *island*, but of appearance of land.

3. Dr. E. Kane's *Report to the Secretary of the United States Navy on his search for Sir John Franklin during the years* 1852-3-4, *accompanied by a Chart, showing the Discoveries made during the course of that Expedition.*

Communicated by the Admiralty.

Dr. Kane left New York on May 30, 1850, in the brig 'Advance,' of 120 tons burden. His company amounted to 18 persons, 10 of whom belonged to the United States navy, and his destination was the highest point attainable through the northward of Baffin Bay in search of Franklin. He reached Cape York ten days after meeting the ice, and passed on August 7 the headland of Smith Sound, and the highest point attained by Capt. Inglefield, R.N., in 1852. Open water lay before him, but a belt of heavy stream ice was soon reached, which was followed by a drifting pack that obstructed the channel. He attempted to push through the pack to the northward, but at lat. 78° 45′ the drifting ice drove him on the Greenland Coast, where he was detained in Refuge Inlet for three days. By a great effort, and taking advantage of openings caused by the tides, he forced a passage to lat. 78° 43′, which was reached on August 29. On the same day Dr. Kane left the ship in charge of Mr. Olsen, and started with boat and sledge to select a spot for wintering. The boat and sledge were successively abandoned, but the work was done. From a cape at an elevation of 1100 feet, a black ridge, subsequently found to be a glacier, was seen terminating the view along the Greenland coast to the eastward. Icebergs crowded the channel, and a frozen sea extended to the range of vision. Winter quarters were selected at Van Rensselaer Harbour near a group of rocky islets in the south-eastern curve of a bay, where the brig was frozen in on September 10. Parties were organized for establishing provision depôts to facilitate researches in the spring, and more than 800 miles were traversed. The Greenland coast was traced for 125 miles to the north and east, and the largest of the three depôts along the coast was formed on an island in lat. 79° 12′ 6″, and long. 65° 25′. Darkness arrested these proceedings on November 20, and the sun continued 120 days below the horizon.

An observatory was erected adjacent to the ship, and a thermal register was kept hourly. The mean annual temperature at this spot appears to be 2° lower than that of Melville Island, according to Parry. The lowest temperature was observed in February, when the mean of eight instruments gave 70°—Fahrenheit. Chloroform froze, essential oils became partly solid and liquid, and on February 24 chloric ether was congealed for the first time by natural temperature. For astronomical observations, a transit and theodolite were mounted on stone pedestals cemented by ice. The longitude was based on moon culminations, corroborated by occultations of planets and the solar eclipse of May, 1855. The position of the observatory was found to be in lat. 78° 37′ and long. 70° 40′ 6″. Magnetic observations, both absolute and relative, were also kept up.

Spasmodic disease occasioned the chief difficulty, but scurvy was completely subjugated. In the form of tetanus, the spasms attacked the dogs, and 57 died, with symptoms not unlike hydrophobia. The loss of these animals seriously affected Dr. Kane's plans; new arrangements had to be formed, which, owing to the smallness of the party, deprived of the dogs, were necessarily restricted.

A passage to the north over the distorted ice, crowded with bergs, was resolved on. A party sent in advance under Mr. Brooks endured great suffering, and barely escaped with the loss of two lives. Another effort in the same direction was made under Dr. Kane's personal guidance during April and May, and journeys by other parties were carried on till July 10. The addition of four dogs, contributed by Esquimaux, permitted the operations to be considerably extended. Out of nearly 3000 miles traversed, no less than 1100 were made with the dog-sledge; and during the following year, 1854–55, Dr. Kane himself travelled 1400 miles with a single team.

Three expeditions crossed the bay. The great glacier in lat. 79° 12′ was surveyed by Dr. Kane in 1855. Another party went to the S. W.; and the shores of the new channel northward were explored by the third. Open waters washed the shores of the channel and terminated in a sea, the heavy surf of which checked farther progress.

The farthest point attained is a precipitous headland, named Cape Independence, in lat. 81° 22′ N., and long. 65° 35′ W. From it the Western Coast was seen stretching to the north with an iceless horizon and a heavy swell rolling on with white caps. Two islands on the eastern threshold of this sea have been named after our lost countrymen, Sir John Franklin and his companion, Captain Crozier. On the west, the coast was observed to be mountainous, and the farthest distinctly sighted point was a lofty mountain, bearing N. 5° E. (solar), estimated to be in lat. 82° 30′, and long. 66° W. (approximate), which Dr. Kane proposes to name after Sir Edward Parry, who, he says, "as he has carried his name to the most northern latitude yet reached, should have in this, the highest known northern land, a recognition of his pre-eminent position among Arctic explorers."

The winter of 1854 passed with many trials, and in the following summer it became necessary to abandon the brig and retreat. On May 17, Dr. Kane commenced his return in sledge boats; on August 6, *in 83 days after leaving* the ship, through many perils and escapes, he arrived at Upernavik, where the Danish authorities gave them a cordial welcome.

The President said that the small vessel in which Dr. Kane sailed brought to mind the voyages of Hudson, Baffin, and other Arctic worthies; and he praised the unostentatious tone of Dr. Kane's report, which touched upon hardships more with reference to those under him than to himself.

He then pointed out the peculiar difficulties and sufferings of the expedition owing to the appearance of tetanus—a complaint almost unheard of in Arctic travel—which had carried off some of the men, and almost all the dogs.

He acknowledged the impartiality with which Dr. Kane had named the farthest points of discovery—which might be called the posts of honour—without national distinction; and said that the zeal and ability displayed in the conduct of the expedition, and the generosity with which Dr. Kane bestowed the praise due to it, upon those associated with him, did credit alike to his head and his heart, and must endear the man himself to all who had, that night, heard the account of his proceedings.

Sir E. Belcher said that, on 17th May, from an elevation of 1500 feet, he had seen the sea open to the distant horizon, or as far as the eye could see, studded with small loose ice, and had no doubt that this was the same icy sea seen in motion by Parry and Kane.

Captain Sherard Osborn having made some observations upon the relics of Franklin's expedition;—

Dr. Rae agreed in the main with Captain Osborn, but wished to remark that the descriptions given by the Esquimaux were distinct and clear.

In the spring of 1850, a party, of at least 40 in number, had been met N. of King William Land, who, travelling southwards, had pitched tents to rest in, and were found dead on a low flat country near Point Ogle. Mr. Anderson had found, on Montreal Island, part of a boat marked "Terror," and the valuables obtained by him were similar to those saved by Sir J. Ross. The account of the Esquimaux was no doubt true in all material points.

He thought Dr. Kane's party would have suffered less had they built snow-houses as he had done, instead of using tents when travelling; he had only two blankets and two skins for every four men, and scarcely suffered from cold. A difference of 15° or 20° in the external temperature made little difference in a snow-house. The position of the ships was supposed to be between Victoria Land and N. Somerset.

The President said he had not wished to bring on a discussion on *points which would naturally* be raised at the next Meeting, and remarked on the confirmation by Dr. Rae of some of the discoveries of Captain Inglefield.

Colonel Sabine referred to the remarkable facts mentioned by Dr. Kane of the great variations of temperature in places in immediate proximity in the Arctic regions, and concluded from this, and from similar facts observed in other parts of the Arctic regions, that in the high latitudes local temperature and productions were dependent on local influences rather than latitude.

Captain Washington said: In common with all interested in Arctic discovery, I beg to express my admiration of the indomitable perseverance and the unflinching courage, under difficulties of no ordinary character, that have been exhibited by Dr. Kane and his gallant crew in the expedition of which we have heard an account this evening; and when we consider that these labours and privations were undergone in the sacred cause of humanity, in the search after our missing countrymen, I feel it difficult to find words to convey my heartfelt appreciation of their heroic exertions and their patient endurance. In answer to a remark of the President as to my opinion with respect to an open Polar Sea, I should not have ventured, in the presence of so many experienced Arctic navigators who are assembled in this hall, to express any opinion on the subject; but as the question has been put to me, I must not shrink from stating my conviction that every fresh fact is in favour of such a theory. Barentz in 1597, and two centuries and a half later Wrangel, found open sea off Siberia, and Parry off Spitzbergen; Penny and Belcher report the same appearance in Victoria Channel; and now Dr. Kane adds his testimony to the rest. It is difficult to resist the weight of such evidence.

Captain Ommanney and Lord Ellesmere having expressed their admiration of the manner in which Dr. Kane had conducted the Expedition, the Meeting broke up.

Fifth Meeting, January 28, 1856.

REAR-ADMIRAL F. W. BEECHEY, PRESIDENT, in the Chair.

The Marquis of Lansdowne, K.G.; *Major Vincent Eyre; F. Dillon Croker; John Anthony Rucker; W. F. de Gex; and H. R. Williams, Esqrs., were elected Fellows.*

The Papers read were—

1. *Copy of a Letter from Chief Factor* JAMES ANDERSON *to* Sir GEORGE SIMPSON, *Governor-in-Chief of Rupert Land, dated Fort Resolution, September* 17, 1855.

Communicated by the HUDSON BAY COMPANY.

After enumerating the almost insurmountable difficulties experienced during the journey, owing to the ice and other obstructions, and giving an account of the twenty-five portages over which the expedition had to pass, Mr. Anderson announced that his party had reached Montreal Island, in the neighbourhood of which undoubted traces of Franklin's people had been found, namely, tin oval boilers, bars of iron, chain-hooks, an iron shovel, and other articles in the possession of the Esquimaux. He also learnt by signs, that they had belonged to white men who had arrived with a boat, and who had died of starvation. He could find no traces of papers or books. At another place some pieces of wood were found, on one of which was cut "Stanley, surgeon of Erebus." Some chips were also discovered, on one of which was the word *Terror*. There was no Esquimaux interpreter in Mr. Anderson's party.

The region visited is described as most inhospitable; there is no wood; few or no deer pass by; while wind and rain are almost constant: so that in the opinion of the author no party could possibly pass a winter there, and any papers or books would speedily be destroyed by the weather or ice.

In reply to a question from the Chair as to the cause of Mr. Anderson being without an interpreter, Dr. Rae explained that the interpreter had been left by him in 1854 at Fort Churchill, and was retained there in the pay of the Company, but in the winter, longing to see his friends, he left, and did not return in time for the express. An old man was sent in his place, but the difficulties of the journey prevented his reaching the expedition, and no other could be obtained.

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2. *A Paper " On the probable Course pursued by Sir John Franklin's Expedition."* By A. G. FINDLAY, F.R.G.S.

Allusion was made to a former paper read by him before the British Association, which showed that there was a constant circulation of the ocean-water around the Arctic basin, which, passing out by Baffin Bay, kept up a perfect system of compensation. This current from the N.W. will drift out any floating bodies in some form, or at some period, or they must be driven by the ice on to the shores. As no remains of wreck or other evidences of the existence of the 'Erebus' and 'Terror' have been met with in the widely-extended search, it may be argued that the first of these events has occurred.

The first evidences of the route pursued by Sir John Franklin were those given by the pieces of a boat's fittings found by Dr. Rae on the S.E. coast of Wollaston Land, Aug. 21, 1851; these were at the head of the flood-tide coming from the N.E. In April of the same year, after the discovery of the winter-quarters of 1845-6, numerous small pieces of wood, &c., were found by Capt. Penny up the Wellington Channel: these it was shown may have come from the S., and therefore do not give so clear an indication. Allusion was then made to the Esquimaux report and sketch brought from Pond Bay, June, 1849, describing four ships near Prince Regent's Inlet, two of which were Sir James Ross's, in Port Leopold, and the other two, to the *westward*, were considered to be the 'Erebus' and 'Terror.'

There is no evidence whatever to show how the interval was passed between the ships leaving Beechey Island in 1846 (perhaps in or after September), and the autumn or winter of 1849, when the boats' crews found their way to the north shore of King William Land, down the Victoria Strait of Rae, and in the spring of 1850, when they reached the mouth of the Back River, where the last sad consummation took place. It was contended that the only indications met with are those of *boats*, and therefore that the ships were deserted to the westward of Peel Sound. For had they passed to the eastward of that part, the retreating party would have passed down Prince Regent Inlet to have availed themselves of the depôt of provisions on Fury Beach, on its west side, found still untouched by Kennedy and Bellot in 1851. By what route the 'Erebus' and 'Terror' arrived at this part is open to all conjecture. They may have passed up the Wellington Channel to the N.W., and then southward down the Byam Martin Channel, and thus arrived at the same spot attained by Capt. Kellett in the 'Resolute' in 1853; or they may have gone to the W. and S.W. past Cape Walker, as the original instructions directed, and by either route become inextricably entangled in the field-ice of Melville Sound. The fate of the ships was then referred to those seen on an ice-floe on the north side of the Banks of Newfoundland on April 20, 1851. The perfect consistency of the evidence, zealously collected, which has never been contradicted or shaken in the slightest degree by any subsequent testimony, leads to the irresistible conclusion that the report is correct. If so, there is no other recorded loss of ships to which they can be referred. The description given exactly agrees with the 'Erebus' and 'Terror.' The possibility of their being those ships was demonstrated by numerous parallel cases of the drifting of vessels. Of these several cases were cited, as occurring between 1777 and 1836; after that, the particulars of the drift of Sir James Ross in 1849, and especially of the American vessels under Capt. De Haven, from September, 1850, to June, 1851; and the drift of H.M.S. 'Resolute,' abandoned in May, 1854, and found in October, 1855, were gone into. A calculation was made from the data afforded by these, that the two abandoned ships seen on the Newfoundland Banks would pass down Barrow Strait and Lancaster Sound after Sir James Ross left in 1849, and before the Austin squadron arrived there in 1850, a period exactly agreeing with the appearance of the survivors on Point Ogle and Montreal Island in the spring of 1850. The progress of the Franklin Expedition may thus be briefly summed up:—They left the Orkney Islands June 4, 1845; their last letters sent from Godhavn on the W. coast of Greenland, July 11, 1845; were last seen in the middle of Baffin Bay, July 26, 1845. They wintered at Beechey Island, and when the ice broke up in 1846, went either northwards or westward, the which cannot now be decided, and ultimately became imbedded, and probably crushed, as stated to Dr. Rae, by the ice in Melville Sound, from whence, slowly drifting eastward, in the autumn or winter of 1849 they dismantled the ships and took to their boats, passing down Peel Sound and Victoria Strait, and found their last resting-place at the mouth of the Back River, where their relics were found in 1854 by Dr. Rae, and in 1855 by Messrs. Anderson and Stewart. The abandoned ships, borne along by the constant circulating current-system, imbedded in the heaped-up ice, ultimately reached the Bank of Newfoundland, and, being crushed, were, as soon as liberated by the thaw, waterlogged, and sunk directly. No traces will ever be found to show how the dreary period between 1846 and 1849-50 was passed, unless at some future period any of their journals or papers may be recovered.

The President having remarked on the numerous subjects of interest opened by Mr. Findlay's paper, said he hoped Captain Collinson would favour the Meeting with his opinion on the probable site of the loss of Sir J. Franklin.

Captain Collinson said he thought the paper just read threw much light on the subject, and, on the whole, agreed with Mr. Findlay; he thought the evidence strong that boats had reached the American shore; and that the search should be continued, on account of those who had lost their lives in solving this geographical problem, and of our national honour, which would be stained if their relics were discovered by another nation. The search might, by means of the provisions now deposited on the shores of the Polar Sea, and by our experience, be prosecuted without risk to life; and the value of the documents to be recovered ought to be placed before the public, together with the fact that the position where to search was clearly indicated. It would give him pleasure to see the point reached by the 'Enterprise' passed by others, so that we might maintain the position our ancestors had won.

Sir G. Back said he had been sent for by the Duke of Northumberland respecting the ships said to have been seen on the iceberg. After careful consideration, it seemed uncertain whether they were ships, although the description corresponded with that of the 'Erebus' and 'Terror.' He then described the drift of the latter ship when under his command. She was cradled on the ice for four months; had at one time twenty-four feet of ice under her; was apparently released, first by revulsion of the floe, and again by contact with other ice, but was afterwards thrown on her beam ends by the uprising of a piece of ice attached to the keel; the ship was a wreck, and only kept together by being wrapped round with chain. These facts would show that a vessel drifting so far might not always remain on the same piece of ice, and he concluded that if a ship were again forced on a floe she must be injured, and if injured her fate must be doubtful. He thought the improbability was great of vessels getting so far, and that they should not have been seen by whalers or vessels crossing the Atlantic was still more surprising, and concluded by expressing his admiration of the manner in which Mr. Anderson had conducted his expedition.

In answer to questions from the Chair, he added that although he did not see the probability of sending out another expedition, he wished that the space between Osborn's and Winniett's farthest could have been examined, as well as that between Rae's farthest and Peel Strait. With respect to the preservation of papers, &c., he would only remark that the sails of the 'Resolute' became so rotten in seventeen months that the sailors could put their fingers through them.

Sir E. Belcher said his experience militated against any outlet from Parry's Sound. The drift was found, both by Parry and Kellett, to be southerly. He thought it impossible that any vessel having been out three years, and subject to its influence, could get past Cape Walker; none of the expeditions had found the sea there unfrozen, and the locality was visited by the expedition under Captain Austin as well as by himself: moreover, the stream sets through Wellington and Byam Martin Channels to the S.E. part of Cape Walker, and the same current taking Sir James Ross's vessels, had forced them to *windward* against a N.E. gale no less than forty miles in twenty-four hours. The mouth of Peel Sound had been well examined by Lieut. Browne and Sir James Ross; and if the boats from deserted ships had touched on either side, some traces would have been found. The discovery of the shovel belonging, as he supposed, to the ship's forge, convinced him that the ship itself could not be far off, and therefore he had changed his former opinion that the expedition went down Prince Regent's Inlet, and concluded that one vessel at least must be near the mouth of Back River.

He thought the author of the paper had not taken the changes of the seasons sufficiently into consideration; his hypothesis involved an open season. In some cases the ice had been known to travel north; portions of the 'Breadalbane' transport, nipped to the eastward of Beechey Island on the 22nd of August, were found alongside of the 'Assistance,' 52 miles N. of Beechey Island, on the 5th of September, and the ice had travelled as far as Hamilton Island. The effect of the main current was to force some things up Wellington Channel and press others on the E. shore. He thought the diagram proved the vessels were not the 'Erebus' and 'Terror;' he felt sure the spars would not have been left standing, and indeed he had private information before leaving England that he need not make search for those vessels on the banks. Icebergs, when they got on the tail of the banks, under the influence of increased temperature, would expand and explode, turn into sludge, and soon disappear.

Dr. Rae differed from Sir E. Belcher. He believed that the ships had been abandoned to the N. of Back River, although the natives had not seen them, and saw no reason to doubt the information given by the Esquimaux; thirty of them had been questioned; they pointed out the place where Sir J. Ross had wintered, and near the N. point of King William Land as the spot where they saw the party dragging sledges and boat; that they had afterwards followed their tracks to the W. of an island that lay to the N. of a large river, where they had turned to the rising sun between the shore and the island, towards the mouth of the river, on low flat ground: there they had found bodies, and a boat turned over, painted white,—and one or two tents; and thought that some had lived until the wild fowl appeared. These Esquimaux he had known in 1846-7. They had also found books which had been given to the children, and torn up by them. One leaf had been preserved, and was now in Greenwich Hospital with the other relics.

The truth or falsehood of Esquimaux stories was easily to be ascertained by cross-examination. Their knowledge of the geography of their country had been remarked by every one. Of this he would give two instances. The country he (Dr. Rae) had surveyed had been accurately described to Sir E. Parry when 300 miles off, and on his return to Repulse Bay they had described to him the position of caches opened by him at nearly as great a distance from that place, which he knew to be the same from their contents and appearance.

Captain Collinson said, with reference to the hope of finding documents, that Sir J. Ross had found a MS. note-book, written by himself in pencil at Fury Beach, when he returned there with his uncle after eight years' absence, unhurt in the pocket of the tent where he had left it.

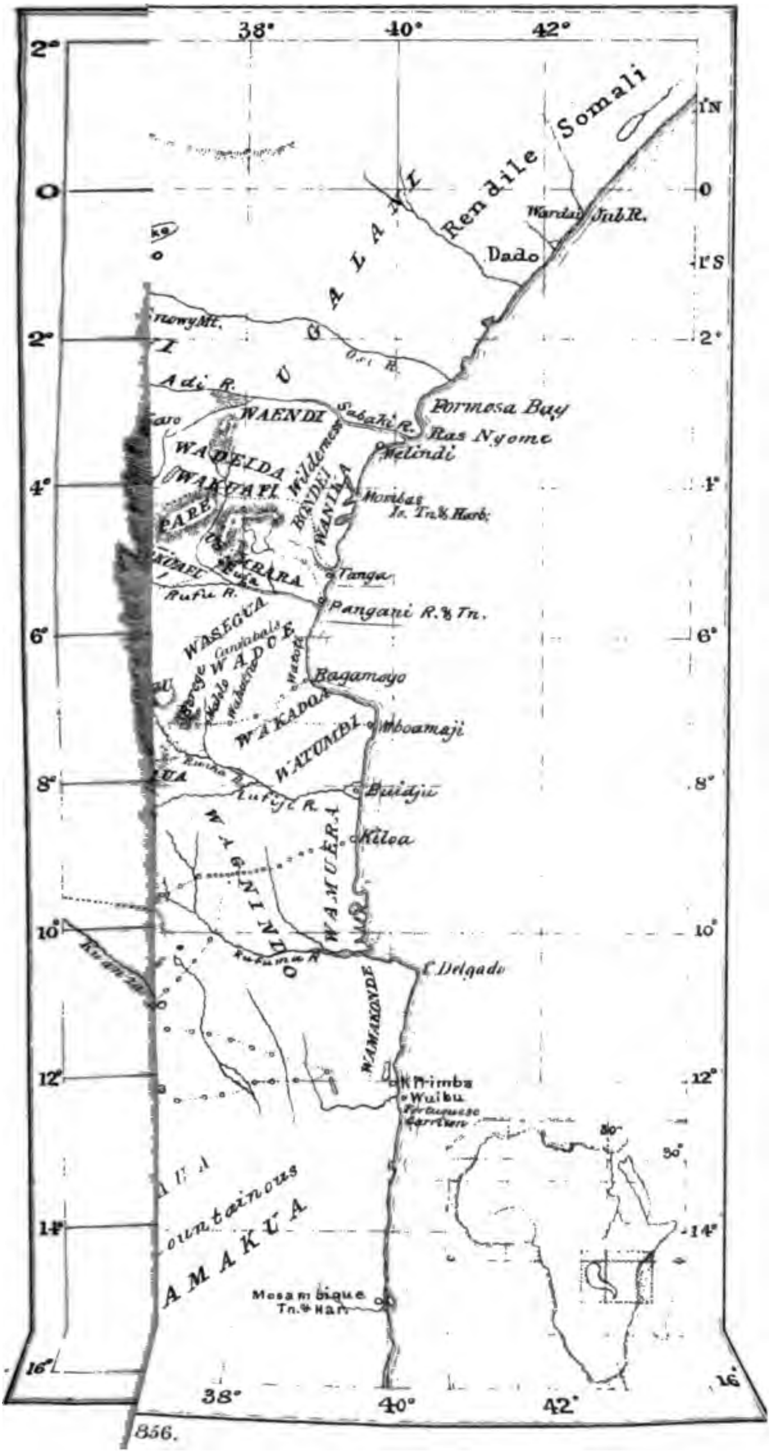
Sir E. Belcher added that portions of the papers left by Sir J. Franklin in 1846, were found by him in 1850 quite legible, though they had been exposed to the weather.

He then explained that the Northern Sea, of which he had spoken at the last Meeting, was not to be confounded with Mr. Petermann's Polynia. The sea along the northern lands was always in motion, and therefore ice would pass along the shore.

With reference to the shovel found, he remarked that all H. M.'s ships were provided with the customary shovels with wooden handles, which would invariably be used in sledge travel. The iron blacksmith's shovel was not only too small in the blade to be useful, but the iron handle would invariably bite the hands.

Sir R. Murchison was glad to see that, though there was so much difference between Arctic travellers, yet that all who had taken part in the discussion had openly or tacitly agreed that a small expedition ought to be fitted out to follow up the clue which had been obtained. Sir G. Back was, at least, willing to allow that a more extended search would have been more satisfactory. Capt. Collinson, who had trended the whole of the North American coast from Behring's Strait to within a short distance of the mouth of the Back River, stated that a search by this line could be accomplished without risk and with an almost perfect certainty of success in a small screw-vessel, and was very decided in favour of a further search. Sir E. Belcher, adverting to the heavy utensils which the survivors of the Franklin Expedition had brought with them, had expressed it as his belief that the remains of the ships were probably not very distant from the mouth of the Back River. Dr. Rae had first given us the clue, and he (Sir R. Murchison) maintained that it would be inglorious on the part of Britain, possessing such a clue and the opinions of such experienced men, to abandon this one small and final effort. He then read extracts from a letter from Capt. Sherard Osborn, expressing his conviction that the ships were still in the ice; that the search should not be discontinued; and that many competent naval men would be happy to serve in the expedition.

Dr. Hodgkin said that long attention to the subject had convinced him of the accuracy of the opinion several years since published by Dr. R. King, that, comparing the results obtained with the expenditure of life and property, the land expeditions of moderate size very far surpassed the ship expeditions, but that of these the employment of *strong* small screw steamers appeared to have the preference.



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Osi R.
Adi R.
Sabaki R.
Formosa Bay
Ras Nyome
Melindi
WAENDI
WADELDA
WAKUAFI
PARE
Wilderness
BONDEI
WANIKA
Mombas Is. Tn. & Harb.
Tanga
Pangani R. & Tn.
Rufu R.
WASEGUA
Cannibals
WADOE
Bagamoyo
WAKADOA
WATUMBI
Mboamaji
Buidju
Lufiji R.
Kiloa
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PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1856.

Sixth Meeting, February 11, 1856.

REAR-ADMIRAL F. W. BEECHEY, PRESIDENT, in the Chair.

Sir William E. Logan, F.R.S., *Chief Geologist and Commissioner of Canada; John Henry Mandeville, Esq., late H.M. Minister Plenipotentiary at Buenos Ayres; Capt. Sherard Osborn,* R.N., C.B.; *The Rev. A. R. Ashwell,* M.A.; *George Thomas Brooking; Marmaduke H. Brooking; Thomas Holdsworth Newman; John Henry Plowes; and Nicholas F. Simmons, Esqrs., were elected Fellows.*

The Papers read were—

1. *Remarks on the Open Sea in the North Polar Basin.* By ROBERT WHITE, Esq.

Communicated by JOHN BARROW, Esq., F.R.S., F.R.G.S.

The object of this Paper was to show from physical causes the probability of an open Polar sea. It was argued that, as the length of the day at the Pole is six months, during the whole of which time the sun shines in one direction, rising perpendicularly for three months and then descending for an equal time, the heat must be great which arises from such constant action. From the time of its first appearance above the horizon, the sun gives heat, and it continues to gain power of melting the ice, without loss or diminution. On the other hand, at a distance from the Pole, the sun sets every night, and the loss of heat, during the time of the sun's absence, has to be replaced on its rising again, before any permanent addition of warmth can be afforded.

Barentz's account of open water was quoted from the work of Admiral Beechey. Baron Wrangell's report of a "wide immeasurable ocean, a fearful and magnificent spectacle," and that of Sir Edward Parry, were adduced in corroboration.

Reference was also made to the Gulf Stream, which, passing Great Britain and Norway, enters the Polar Basin; and, having made its entire circuit, returns by Davis' Strait to the Atlantic Ocean; and the evidence through which its course could be ascertained, was gone into.

The President: As a small volume from my pen has been quoted by Mr. White in support of his opinions about a Polar basin, I cannot avoid offering a few remarks upon the subject before us, lest I may be supposed to assent to the speculative notion of there being a permanent fluid oasis amidst the great frozen desert of the North. And first as to the effect of the sun's rays at the Pole, it is not easy to attach any other meaning to Mr. White's remarks about the sun's shining continually "*upon one point*" and "*in one direct line*," than that the motion of the earth at the Pole is not sensible, and that the same surface is always presented to the sun. If such is the meaning of the writer, his arguments have been founded upon false premises; for in no part of the globe is the sun's azimuthal motion more apparent than at the Pole.

Arguments in favour of a Polar basin have been founded upon the data of Dové, which show that the point of maximum cold upon the globe does not coincide with that of the maximum of latitude. But admitting this to be true, if the cold at the Pole is sufficient to freeze the sea, and to keep it at such a mean temperature that the summer influence has but a comparatively trifling effect upon the ice formed upon it, it is surely a sufficient contradiction to such arguments; and it has been shown by the same great authority, Dové, that the mean annual temperature at the Pole is upwards of 30° below the freezing point; that the mean temperature of the coldest month is 58·6° below the freezing point; and that the mean temperature of the warmest month is still more than a degree below the freezing point. Who can read these temperatures and then turn to Parry's voyage, and, at a distance of 16° from the Pole, contemplate the *mean* temperatures registered in the following months by him, viz.—

Jan. ..	62°	below freezing point.	July ..	10°	below freezing point.
Feb. ..	64	,,	Aug. ..	0	,,
March ..	50	,,	Sept. ..	10	,,
April ..	40	,,	Oct. ..	36	,,
May ..	15	,,	Nov. ..	52	,,
June ..	4	,,	Dec. ..	54	,,

—who, I say, can read these terrible mean temperatures of the several months, both by Dové and by Parry, and believe that the sea remains navigable, except perhaps in the very limited space between the broken floes of ice, and that only for a very limited period?

Mr. White quotes Sir Edward Parry in favour of his theory of a Polar Basin, and triumphantly remarks: "In Captain Parry's journey, at his farthest point, there was nothing more to impede a vessel's course than was met with near the margin."

I really do not know what stronger proof can be required than this of the Polar Sea being covered with an enormous mass of impenetrable ice. *Captain Parry, after* travelling 660 miles over this mass of ice, declares it to be of the same character as that at the margin, that is to say, of a character which had resisted every effort to penetrate it. There was no sign whatever of its terminating; it seemed immeasurably spread, and might have extended to the Pole.

Mr. White admits that there is a barrier of ice to the N.W. of Spitzbergen, but, he says, no such barrier exists on the Nova Zembla side of that island.

A similar assertion to this has been made more than once in the rooms of this Society, but I am sure it has been done without consideration of what has been recorded by various navigators who have attempted to penetrate the sea in that direction.

Extracts were then read by the President from Barentz's Journal, by which it was clear that the ice was traced all the way from Cherry Island to Nova Zembla. Hudson, he remarked, was also foiled in this same direction, so were Wood and Flawes, Baffin and Fotherley. Lastly, in 1819 and in 1824, Lütke, a distinguished Russian officer, made two successive attempts to proceed in a northern direction, and to get round the north end of Nova Zembla: in both of these he failed, after tracing the ice nearly all the way from Spitzbergen to that island.

As to Barentz's voyage authorising a belief that there is no ice about Nova Zembla, the President read further extracts from the above-mentioned voyage to precisely an opposite effect, and went on to state that between Nova Zembla and Cape Taimena lies the sea of Kara, which no person has been able to navigate except towards the Waigatz, where the strong tides break up the ice. The difficulty of passing Cape Taimena is given by Baron Wrangell. To the eastward of Cape Taimena we have numerous attempts to navigate both east and west from the Lena and Kolyma, in Müller, every one of which failed by reason of insurmountable impediments from ice.

Since these voyages were attempted, Baron Wrangell and Lieutenant Anjou have visited the coast about Siberia, and the Baron has successfully accomplished a journey from the Lena to Kamschatka.

In these voyages the sea is stated to have been free from ice to the north, but it is to be observed that the shore from which these remarks were made was scarcely above the water. The utmost extent of the horizon of the observer could not have been more than ten miles; so that we are not surprised to hear that a few miles beyond Wrangell's sphere of vision the 'Vincennes,' only last year, found a wall of impenetrable ice. Such statements are but proof of the imprudence of drawing such wide conclusions from so narrow a field of observation. It may be that the great rivers near this part of the coast kept the ice off the shore; but that it was not far off the shore may be inferred from the very thin ice which fringed the north shore of Siberia. Had there been any considerable space of clear water, the sea that would have arisen would have annihilated such ice. It appears that when the wind blew from the west, the Polar ice set down upon these islands, visited by Lieutenant Anjou, and that the officer assisting him could not get round the land in that direction. These occasional openings only show that the ice, yielding to an enormous pressure of gales at sea, occasionally moves off to a short distance from the shore; whilst the return of the ice to the shore, on the cessation of the wind, effectually proves that the sea is covered with a mass, which yields to the prevailing pressure of the elements. From these remarkable facts, and indeed from all the Polar voyages, the only rational conclusion is, that near the land there are occasionally large spaces of open water, which, whenever they may be followed up, will be found to terminate in ice, and to arrest the progress of a vessel.

How dangerous it is to found an argument from appearances limited to the narrow sphere commanded even by a mast-head view, may be gathered from the many contradictions which have of late been given to the most promising appearances of that nature. Had a spectator viewed the sea from the northern coast of America, about the Mackenzie, when visited by some of our travellers, he would have returned and reported an open Polar Sea; whereas we know, from the reports of Collinson and M'Clure, that there is an impenetrable barrier of ice to the northward, which is well known to the Esquimaux to be permanent. The same promising appearance was observed by Penny, Sir Edward Belcher, and others. In the case of Penny, it is proved that just beyond his horizon the ice covered the whole sea and did not break up the whole of the summer of 1853, and that an expedition of thirteen boats, on sledge runners, passed over this very spot on their outward journey from the ship of Sir E. Belcher.

Sir Edward Belcher stated he had discovered the Polar Basin; but we have learnt from himself, on a recent occasion in this room, that a Polar basin, in his interpretation, is a sea covered with moveable masses of ice—a sensible interpretation, in which, I believe, all Polar navigators will concur.

Captain Inglefield, in the same sanguine feeling as Baron Wrangell, reported that he had discovered an open Polar basin when he returned from Smith's Sound, whereas we now know Dr. Kane found all that sea covered with thick ice, which did not break up all the summer, and over which he travelled in his sledges.

But not to occupy the time of this Meeting, it is quite clear that had these discoveries not been followed up, a Polar basin would have been declared to exist in the case of Penny; had Inglefield's track not been revisited, a Polar basin would have been said to exist there; had Wrangell's ground not been revisited, the same would have continued to be said of the sea in that quarter; and there is the same reason to believe that if Dr. Kane's discoveries be followed up, they will lead either to a vast inland basin or to a sea covered with the same moveable mass of ice travelled over by Parry, and which has stopped M'Clure, Collinson, Sir E. Belcher, and all other Polar navigators who have endeavoured to penetrate those seas.

Mr. White observed, in reply, that his interest in the existence of an open Polar sea had been excited by sympathy for Franklin. Another probability that some of Franklin's party existed was suggested by Dr. Kane, who stated that some of his men were very anxious to remain with the Esquimaux, and he had great difficulty in persuading them to return with him.

Sir Robert M'Clure and Captain Kellett were also of opinion that some of the men might still be living among the Esquimaux.

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2. *Report of* Surveyor T. Austin, *Commanding the Expedition to explore the Interior of Western Australia, N. and E. of the Settled Districts.*

Mr. Austin commanded an expedition sent by the Government to search the interior of Western Australia, N. and E. of the settled districts, for land available for pastoral and agricultural purposes; and his party consisted of 10 men and 27 horses. Starting from near Perth, on July 10th, 1854, he ultimately arrived at the Geraldine mines on the Murchison River (about 27° 50′ lat., 114° 40′ long.) on Nov. 20th. The direction of his route was as follows:—First to a little beyond Cow-cow-ing 31° lat., 118° long., then northward to a great dry salt-water lake 1,400 feet above the sea, in 27° 40′ lat., 118° 30′ long.; thence in a north-westerly direction, approaching the

26th parallel, in long. 116° and 115° E.; and lastly, back to the coast by way of the Murchison River.

The country traversed by Mr. Austin was very indifferent, and to the westward it appeared to change for the worse.

The salt-water lake above-mentioned pours its waters at the time of heavy rains through Lake Moore, discovered by Mr. Gregory, and thence through Cow-cow-ing Lake into the Swan River. But the river beds to the north of the salt-water lake run towards the Murchison River, and Mr. Austin thinks that his route led him near the N.W. border of the basin which supplies the Murchison.

Large numbers of natives come down these river beds at the latter end of the dry season, and red kangaroos, emus, and turkeys were very numerous in their neighbourhood.

3. *Notes on the Probable Condition of the Interior of Australia.* By H. Landor.

If you take a map of Australia, the first most striking feature is the absence of large rivers debouching on the coast, from the mouth of the Murray westwards and northwards until the Victoria River is reached. I put out of the question the rivers of Western Australia, all of which, except one, are mere surface drains. I have myself headed the sources of every one of them, and know that they only contain running water in the summer, and have their origin within 200 miles of the coast. The exception is the Blackwood, which falls into the sea near Cape Lewin: this river has communication with a chain of shallow lakes, that extends towards the interior farther than my knowledge.

Now on continuing our examination of the map, we find numerous rivers on the northern coast and in the Gulf of Carpentaria. It is obvious that the watershed that throws these streams to the north and north-west has also another side which throws its waters towards the south and the interior. Why then do they never reach the coast? They spread themselves out on the flat surface of the interior, which is very little above the level of the sea, and they collect into large shallow lakes, which have outlets in very wet seasons by Shark Bay, the Blackwood, Spencer Gulf, and Eyre Lake into the Darling. What proof is there of this? I will name many proofs. First I have passed over many miles of country of a hard clay formation, with small prickly scrub on it, and coarse marshy grass, and marks of water-drift all over it, small weeds and sticks lodged high in the scrub, on banks a little higher than the general level of the plains; and this over many hundred square miles of country, which must be one vast lake in the winter or wet season. The absence of animals of the burrowing marsupials, and of reptiles that always swarm on such plains when they are not subject to periodical floods. The want of kangaroos, which dare not venture too far into the country, lest the waters of winter overtake them. The marks of the abrasion of the surface by the trickling stream as it gradually runs away, when the rains are over. All these signs indicate a state of things that cannot be mistaken; but there are meteorological reasons that make this condition of the interior an absolute certainty, and these are the conditions of the hot winds that prevail in every colony in Australia. Now in whatever (Australian) colony* one may live (and I have been in them all), the hot wind always comes from the interior; that is, in Western Australia it is an east wind, in New South Wales it is a west wind, and in South Australia it is a north wind. Must not then the cause of its temperature be sought in the interior? The reason is that when the water is evaporated from the surface of the interior, the powerful sun converts the shallow winter lakes into parched and burning plains, which are to the traveller like hot ovens. To Capt. Sturt they showed a temperature of 130° in the shade of his tent. I have seen the thermometer at 120° in these plains for days together, and not falling ten degrees in the night. The air of the whole country dances and glistens like a burning brickfield. The winds that pass over this heated country, convey a temperature which is well called a hot wind, towards whatever colony they may be blowing. Again, the very wind that is in the summer so hot, is in the winter the coldest, (that is, the wind from the interior is the coldest wind that blows in the winter,) and the reason is, that it then passes over an immense evaporating surface; the interior country being then covered with shallow water, the air passing over it is cooled much below its natural temperature, and arrives at the colony a cold wind. I believe this reasoning to prove that the vast majority of the interior is as I have assumed it to be, and that it never can be made available for habitation or for commerce, excepting only on or about the dividing ridge or slight elevation (for it can be no mountain) which gives origin to the northern rivers.

4. *Progress of the North Australian Expedition.* By A. C. Gregory, *Commander.*

Communicated by the Colonial Office.

Victoria River, N.W. Australia, 24th September, 1855.

On the 12th of August the Expedition left Moreton Island, and on the 13th entered the inner passage to Torres Straits. After a somewhat tedious passage we reached Albany Island on the 26th, sighted Port Essington on the 1st September, and cleared Clarence Strait at noon the following day; but owing to the great indraught of the deep indentations of the coast, the 'Monarch' so greatly deviated from the direct course, that at 10 P.M. she grounded on the Northern reef in the entrance of Port Patterson, and with some difficulty the 'Tom Tough' was extricated from the reefs as she was following the bark.

Unfortunately this occurred at the time of high spring-tide, and it was not till the 10th that endeavours to get the vessel afloat were successful.

The reef being dry at low water, we were enabled to examine the vessel; but she did not appear to have suffered any material injury except the loss of about 30 feet of the false keel, nor did she make even so much water, after being got off the reef, as when at Moreton Bay.

On the same day that the 'Monarch' was got afloat, we sailed for the Victoria River, but owing to strong tides and calm weather the vessels separated on the night of the 12th, and I arrived at Point Pearce in the schooner on the 14th. Not finding the bark in Treachery Bay, I proceeded to Blunder Bay, where we arrived the following evening. Finding both water and grass scarce at this point, and the shore ill suited for landing the stock, I returned to Treachery Bay on the 18th, and found the bark had been delayed for three days off Cape Hay by a calm, which I had escaped in the schooner by keeping within the influence of the land-winds.

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* *In North-Eastern* Australia, which is still unsettled, Leichhardt remarked the *absence of the hot* winds from the interior.—Ed.

The water and forage for the stock on board the bark* having been consumed, and the condition of the horses rendering it imperative that they should be disembarked without delay, I deemed it advisable to land the horses at Point Pearce as the only means of saving the majority of them.

The strength of the tide, however, rendered this a very tedious work, and it was not till the morning of the 21st that they were all landed and removed to a swamp near Providence Hill of Captain Stokes, where both water and grass are abundant. Only 42 horses are now at the camp, and few of them are at present in a serviceable condition, having suffered greatly from the delays at Moreton Bay and Port Patterson. The casualties have been as follows:—Two horses died on the passage, five were lost in landing through exhaustion, and one has escaped to the bush, but may perhaps be recovered. Of the sheep, only six were lost to the time of reaching Point Pearce, since which nearly thirty more have died from various causes, but principally by drinking salt water on landing.

It is now my intention to proceed by land with the horses, as soon as they are capable of travelling, to the Victoria River at Kangaroo Point, and to send the sheep by the schooner to that spot as a rendezvous for the party; but I do not expect to be able to commence any distant explorations till the end of October, as the stock will require a month's rest to recruit their strength.

I have observed nothing to render it desirable to deviate from the proposed direct route into the interior of the country, though, from the general features of the Victoria River near the mouth, I have reason to expect that it will prove but an insignificant stream after ascending beyond the tidal influence.

Not having any cause for delaying the 'Monarch' beyond this date, I have informed the master of her to that effect, and have given certificates of the performance of the charter-party.

I have transmitted directly to the Secretary of State for the Colonies, with the exception of one set, all the botanical specimens collected by Dr. Müller, which, from their perishable nature, it is desirable should reach England as soon as possible.

Should the schooner move from the Victoria River, in carrying out the objects of the Expedition, I intend to place conspicuous marks and leave some records of intended movements of the Expedition on the Northern end of Entrance Island in the Victoria River.

Up to the present time none of the Aborigines have been seen, though many fires and other traces show them to be numerous on this part of the coast. I am therefore unable to ascertain whether their intentions are hostile or otherwise.

5. *A Letter from* Mr. J. Wilson, *Geologist to the North Australian Expedition.*

Communicated by Sir R. Murchison.

Board Ship 'Tom Tough,' Point Pearce, 23rd September, 1855.

You will feel pleased to know that we have at length arrived at the Victoria, and that our explorations will soon commence. We have had some little mishaps, which we are all willing enough to attribute to the captain of the 'Monarch.' . . . . We ran up during the night with perfect safety, and anchored in Blunder Bay. The 'Monarch' not having arrived, Mr. Gregory took the opportunity to go ashore and look out a landing-place for the horses, and for water, and we were successful in our search for both. I happened to be the first to find the water. The discovery at that moment was fortunate, as one of our men had an attack of sunstroke. Applications of the cold water restored him. The discovery of water here was rendered still more pleasing in consequence of Captain Wickham having signified to us his doubts of the existence of fresh water at Blunder Bay. We returned to the ship immediately, and dropped down the river with the tide to go in search of the 'Monarch,' and on the second day after, found her at Point Pearce landing the horses; the pretext for doing so, being that the stock of water had been exhausted, and the cattle suffering for want of it. The captain was blamable in having refused to take in water on the voyage, where he could have done it conveniently. A number of the horses having been landed when we arrived, the work was necessarily continued. The ship lay anchored two miles from the beach, and the horses had to be towed that distance. Five of them were drowned, and three died aboard: altogether we have lost eight out of fifty horses. Water was found with some difficulty by Mr. Gregory's brother, 6 miles from the landing, where the horses are now encamped, and fast improving. The horses and a part of our company are to proceed round the head of the Fitzmaurice to the Victoria at Kangaroo Point, where the schooner and the remainder of the party are to await their arrival. The country to be crossed consists of rugged sandstone hills, and possibly is as bad as any that we shall have to travel over. Mr. Gregory was on board the 'Tom Tough' from the time the 'Monarch' was got off the reef; his object being to keep in advance, and to lead the 'Monarch' up; and I think that advantage was taken of his absence, to land the horses short of their destination—the navigation of the river being beyond the limits of the 'Monarch's' insurance.

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* *See p. 49 for particulars of the outfit of the Expedition.*

Several sketches by Mr. T. Baines, the artist to the N. Australian Expedition, were laid on the table.

Sir R. Murchison rose to express his regret that the report of Mr. Austin, or at least portions of it, could not be read at greater length. Although a blue-book, it was an Australian blue-book, and very different from those we are accustomed to see. It was accurately and humorously written, and illustrated by lithographic sketches.

Sir Roderick then referred to the journey through West Australia made many years ago by Lieuts. Grey and Lushington, the former now the Governor of the Cape, stating that they first pointed out the Glenelg River, Arrowsmith River, Murchison Mount, and other characteristic features of N.W. and W. Australia. Some fertile tracts are found, but they are few and far between. There is a remarkable absence of limestone in North-west Australia; great variety of vegetation where it did exist, and eruptive rocks very prevalent over the surface. He then pointed out the main object of the present expedition to North Australia, viz., to discover the source of the great river Victoria, to trace the line of watershed eastward into the interior as far, it was hoped, as the source of the Albert, in order to connect the new explorations with those of Sturt, and Mitchell, and Kennedy. He thought it was a most praiseworthy undertaking, as it would tend to the establishment of a colony in North Australia, which would materially strengthen the powerful position we already held in the East. It was besides a most necessary undertaking, as our countrymen are gradually finding their way into North Australia from the South. The establishment of a colony would then probably lead to the adoption of a route overland, and ultimately through the Gulf of Carpentaria, so as to avoid the dangerous passage through Torres Strait.

Count Strzelecki bore testimony to many statements contained in Mr. Landor's letter, and expressed his opinion that the paucity of positive facts and observations collected upon this important subject is such, that it makes it hazardous, as yet, for a meteorologist to venture upon a theory, which would offer a satisfactory solution of the problem. His own study of the phenomena during five years in Australia, as explained in the 'Physical Description of New South Wales and Van Diemen's Land,' and the 107,000 numerical elements which he computed from registers of simultaneous observations kept in several stations over 14° of latitude, gave him only an insight into the character, but not into the causes, of the hot wind. These numerical elements showed that the wind—

1. Impedes the calorific effects of solar rays.
2. Decreases their intensity.
3. Increases the temperature of the ambient air.
4. Increases the atmospheric pressure.
5. And finally, as to its hygrometric condition, that it is endowed not with a capacity for moisture, but with a power of dissolving it in whatsoever form it is collected.

Besides these results, the examinations showed that this wind raises in the air, clouds of impalpable particles of earthy constituents, which, by their contact, friction, pressure, and caloric, impart to it the character of a huge electric apparatus, highly acting upon the whole economy of nature. But how this huge electric machine is set in motion—how far the declination of the sun, the violence of the monsoons which encircle the Australian continent, and the probable depression of its centre, exert an influence upon it, is as yet impossible to determine. Moreover, the Australian hot wind is not a local and exceptional phenomenon, but belongs to a series of identical phenomena which are observed in Egypt, Abyssinia, Syria, Arabia, Bombay, Persia, California, and Atacama; so that a theory advanced to explain the causes of the hot wind of one country, in order to prove of value and soundness, must be applicable with equal force to explain the remainder of the series, in which range the theory promulgated by Mr. Landor seems to be deficient.

As to the importance of the North Australian expedition, and the imperative necessity for the occupation and settlement of Northern Australia, he concurred entirely in the opinion expressed by Sir R. Murchison upon this important subject. He then complimented the Society for having urged on the notice of Government so desirable an undertaking, and remarked that so much importance was attached to it in a commercial, as well as in other points of view, by many of the City merchants, that Mr. Matthew Uzielli, a member of the Society, placed at his disposal 10,000*l.* to be applied by him, in the event of the Government refusing to send out the expedition, for the purpose of carrying out the object in question. In conclusion, Count Strzelecki passed an eulogium on the fine spirit which actuated the member alluded to, and said that he felt assured that this Society and the public at large would join him heartily in tendering a vote of thanks to Mr. Uzielli, for his munificent and disinterested offer.

Mr. Uzielli, responding to the call made upon him by the President, said that he was taken unawares by the reference made to his offer to advance 10,000*l.* towards defraying the expenses of the North Australian Exploring Expedition; he in the mean time felt it his duty to say, that although not *au fait* in a scientific sense to the great advantages of the survey, he felt sufficiently as a commercial man, the great importance that must be derived by this country from the undertaking. That the commercial advantages of the expedition, and the desirability of securing ourselves there, and thus preventing others from taking possession of a country so valuable as a protection to our East Indian colonies, weighed with him a great deal at the time he made the offer alluded to by Count Strzelecki. He nevertheless was very glad to find that our Government had decided on making the expedition a national and not a private one.

Seventh Meeting, February 25, 1856.

SIR RODERICK I. MURCHISON, V.P., in the Chair.

Viscount Boyne and the Hon. Arthur Dillon were elected Fellow

The Papers read were—

1. *On the Formation of Cyclones, and on the Tracks they pursue.* B
Captain ALFRED PARISH.

Communicated by Capt. FITZROY, R.N.

Captain Parish's Paper is strictly argumentative, and hardly admi of condensation; the facts upon which his arguments rest are stated t be derived in part from his own observation, and in part from the invest gation of a number of log-books to which he has had access. His co clusions are, that all winds, excepting where influenced by the proximit of much land, are parts of Cyclones; obeying in their respective hem spheres the laws which have now been proved to govern hurricane both with regard to their tracks and rotatory motions. When the C clones (or rotatory winds advancing on a line) are of very large dia meter, such as those of which he conceives the trade winds to form a par they strike the earth's surface diagonally; but when they are of limite diameter, as those in the higher latitudes, or of still less diameter, as i the hurricanes of the tropics, they either descend horizontally or else s nearly so, that they may always be looked upon as horizontal.

CAPTAIN FITZROY paid a tribute of esteem to the author, who was a nephe of Sir Woodbine Parish, and captain of an Indiaman; and who, during the la fourteen years, had made several voyages to India, and had employed his leisu time on board ship in making a series of observations. He had thus given a example of what the captains of many of our large merchantmen are no doing, whose painstaking and able observations have already produced mo valuable results.

The opinion of Captain Parish resembles that of Professor Dove, th great German authority on atmospherical questions, who had stated hi views upon these subjects at the meeting of the British Association in 185 Captain Parish, he thought, had carried the principle rather too far. H takes a view which is often adopted by those who have been much smitte with the Cyclone theory, and are inclined to think of exceptions rather tha of the rule, the rule being as follows:—There is a regular movement of va masses of the atmosphere in certain directions all the year round; betwee these greater streams are eddies moving more or less as cyclones, being modifie by the temporary influences of heat or some electrical causes which we do n yet thoroughly understand. These great atmospheric movements are seen i the zone of trade-winds on either side of the equator, and in the westerl winds of higher latitudes. If we lay down the courses of the trade-win for every month, we shall see that they agree in direction from mont to month throughout the year, especially between the parallels of 10° and 20° *indeed they blow in* nearly uniform lines the whole year through: there nothing approaching to a cyclone in their movement. In the upper regions of the atmosphere there is usually a counter-current in an opposite direction to that of the trade-winds beneath; so that although no horizontal rotatory motion takes place, there may be a vertical one.

In higher latitudes, as before said, the prevailing winds are westerly; there is thus a general movement of the atmosphere in all parts of the world, to which cyclones form exceptions like eddies.

Captain Parish, in his paper, does not allude to the complete change in the *character* of the wind which takes place in every storm in high latitudes.

In the latitude of the British Islands storms usually begin with a S. wind, that brings thick and dirty weather. It then veers round to S.W. and W., and finally clears up with a N.W. or N. wind. Now if the winds went round in a circle, according to the common theory of cyclones, there is no reason why the character of the weather brought by the storm should not be always alike, no matter from what quarter the wind came. He (Captain FitzRoy) would rather ascribe these so-called circular movements to two bodies of air coming from different directions and meeting together—the one which has the greater momentum overcoming the other.

In the S. hemisphere we find an exact converse to the above. Dirty weather is brought by the wind from N. and N.E., and it is cleared away by a wind from the S.W. and S. The remainder of the circle is not in any of these cases filled up. There is nothing like a continued rotation round a centre.

The cyclone theory applies completely to the hurricanes of the Atlantic and Indian Oceans, and also to those storms which in Eastern seas are called tyfoons; but as far as general experience goes, that theory is not so satisfactory in the explanation of those phenomena which accompany the winds of high latitudes.

There is no doubt that many storms are connected with the progress of atmospheric waves, *i. e.*, with those undulations of the atmosphere which are shown by variations in the height of the barometer. These waves at their height cause a pressure which must give rise to a horizontal movement of the air more or less strong according to the height of the waves on each side of the trough.

Le Verrier, in investigating the storm of Nov. 1854, that was so severely felt at Balaklava, has shown that it was connected with the progress of an atmospheric wave moving from England across the continent of Europe to the Black Sea.—(See *Comptes Rendus*, No. 27, Dec. 1855.)

2. *Notes on the Condition of the Gipsy Population of Moldavia.* By SAMUEL GARDNER, Esq., *H.M. Consul at Jassy.*

Communicated by the Earl of CLARENDON.

Mr. Gardner enclosed with his paper the Moldavian Gazette of Nov. 29th, containing a message of the Hospodar to the Council of State relative to the manumission of the Tzigan (Zigani) or Gipsy population, which has been hitherto condemned to prædial slavery in Moldavia. He remarks that the condition of those who have been manumitted, has not yet been much benefited by the change. They have been placed on the list of "contribuables," or tax-payers, and *have still their former* burden of villenage, and much other service imposed on them. The number of families, according to the Prince, does not exceed 20,000.

"The Gipsies, or Tzigans, whose numbers are great, amounting to 120,000 souls, are an intelligent and industrious race, and in their general condition of prædial slavery (for few are in reality emancipated) are a reproach to the country and to the Government. Many of them are taught arts. They are the blacksmiths, locksmiths, bricklayers, masons, farriers, musicians, and cooks especially, of the whole country. A short time since Mr. Willis, of Bombay, nephew of Mr. Young, the celebrated husbandman, who held large estates near Theodosia in the Crimea, which, after his decease, Mr. Willis was proceeding to sell, passed through Jassy on his route to Odessa. On a friendly visit to me the conversation fell on this singular people, and I sent for one who had a forge near the consulate, and whom I had often employed. I had often thought them to be of distant Indian origin, but they give themselves the Egyptian appellative of Pharaon. Mr. Willis, who spoke Hindostanee, found that he could hold converse with them in that language. The glare of wild surprise in the eyes of the Gipsy at finding a stranger speaking a common language, made a strong impression on both of us. In a work on the frescoes of Thebes, the Egyptian task-master is represented as overlooking the Jews making bricks, and the observations on the latter are that the same features are to be met with at present at Rag Fair, in London. It is the case with the poor Tzigan or Gipsy. His features are quite Egyptian, but, poor fellow, he is become the brickmaker under harder masters than his fathers had ever been to the Jews. The period of the immigration of the Gipsies into Moldavia, I could never learn from the Moldavians. Their numbers during the former reigns of their princes or rulers excited alarm, and they were distributed as serfs amongst the Boyards, treated as the brute beasts of the field, and disposed of by sale or by transfer. A late order of the Assembly-General emancipated the Gipsies in the church domains, and Prince Michael Stourdza emancipated his own, but the Boyards composing the Assembly did not permit the Gipsies on their own estates to partake of the same benefit; and it is a measure which has never had any real execution with the others. They remain in their condition of prædial slavery, and are employed for every servile or menial office. They dwell in winter in subterranean excavations, the roof alone appearing above ground, and in summer in brown serge tents of their own fabric. The Russians in their winter campaigns in Turkey, and in these provinces, have imitated these excavations in lieu of encampments, and they seem admirably adapted for it. The idea may also have originated from the castrum of the Roman legions in Dacia, during the winter. The children, to the age of 10 or 12, are in a complete state of nudity, but the men and women, the latter offering frequently the most symmetrical form and feminine beauty, have a rude clothing. Their implements and carriages, of a peculiar construction, display much ingenuity. They are in fact very able artisans and labourers, industrious and active, but are cruelly and barbarously treated. In the houses of their masters they are employed in the lowest offices, live in the cellars, have the lash continually applied to them, and are still subjected to the iron collar and a kind of spiked iron mask or helmet, which they are obliged to wear as a mark of punishment and degradation, for every petty offence. They are subjected to other servile regulations. When required by the master for any work as masons or artificers in town, they are not allowed to quit the premises during the hours of labour, and they are encamped beyond the barriers of the city during the night, where they remain; their proximity being always noted by the firing of guns and pistols from the inmates of the neighbouring houses, to warn them that they are on their guard. They have the worst of reputations, as robbers, thieves, murderers even, and I have travelled at night with a Boyardess of rank with her young family through their tented villages, who seemed to regard the incident as one of some danger and alarm. For myself, I have never regarded them otherwise than a poor outcast race, injured and ill-treated, have never felt the least apprehension of being amongst them, and have invariably found them kind and obliging. The force of prejudice is great, and the fears entertained of these poor helots are the strongest condemnation of their treatment."

SIR HENRY RAWLINSON said that on a former occasion, about five years ago, he had read a paper before the Society on the Comparative Geography of Babylonia, in the course of which he had explained his views with regard to the migrations of the Gipsies. As the subject was now again before the Meeting, he would, if permitted, repeat his observations.

The Asiatic origin of the Gipsies has long been regarded as an established point in ethnographical science. The swarthy features of the race, their Oriental cast of countenance, and above all, their language, which, wherever they may be found, resembles more or less the vernacular dialect of India, have been admitted to afford evidence of an Eastern origin which cannot be contested. At the same time, how or where the Gipsies could have passed over the intervening continent of Asia, has hitherto baffled all research, and caused their settlement in Europe to be considered a sort of ethnographical puzzle. He (Sir Henry Rawlinson) had, however, in the course of his reading, lighted on many passages in Eastern writers which seemed to refer to this movement of the Gipsies, and he would accordingly give an abstract of the notes he had collected on the subject.

There were certain Indo-Scythic tribes located on the banks of the Indus soon after the Christian era, whose language probably formed the germ of the modern Hindostanee; for this dialect, though much overlaid with Sanscrit colouring, is in its structure essentially Turanian. Among such tribes the chief were those named by the Greeks, the Getæ and the Sacæ, or as they termed themselves, giving a plural ending to the nouns, *Jatán* and *Sugán*.* They were famous as musicians and workers in iron, but were also notorious for their turbulent and depraved habits. *Bahram Gur*, in the fourth century, first moved a colony of them into Persia, and settled them in the modern province of Kerman. Eastern writers, in describing this settlement, usually call the colonists *Lúlis*, or *Lúris* (which is the same name as the Indian *Lodi*, whence Lodiana, &c. &c., the *Lodis* being a branch of the *Jats*); but the more authentic historians, such as *Ibn Mukaffá*, &c., have preserved the name of *Zatán*. Parties of these Indian *Jats* were still in the Kerman mountains when the *Kúfs* and *Belús* (modern *Kooch* and *Belooch*) first settled there, about the time of the Hejrah. Other parties of them, however, had migrated westward and established themselves in Susiana, where they gave their name of *Zat* to a district in the vicinity of *Ahwáz*.

During the first century of Islam, the *Zats* or *Jatán* of Susiana were joined by large parties of their countrymen from the mouths of the Indus, who came to the Persian Gulf as buccaneers and pirates, and subsequently settled in the Chaldæan marshes. Here they increased and multiplied, and all the Arabic writers of the second century of Islam, speak of the Zats about the confluence of the Tigris and Euphrates, as living in a state of almost complete independence, defying the authority of the Caliph, and extending their depredations on all sides. They were also notorious heretics, still apparently clinging to their old Indian idolatry.

At length in A.H. 220, their turbulence becoming intolerable, *Moatesem*, son of *Mamún* and grandson of *Harún al Rashíd*, sent his famous general *Ajíf* with an overwhelming force to subdue the *Zats* and remove them from the country. Ten thousand of them perished in their attempt to resist the Caliph's troops, and the remainder, with their wives and children, were forcibly deported and brought to Baghdad. From hence, in the first instance, they were marched to *Khannikín*, on the Persian border; but still continuing unmanageable, they were in the sequel transplanted in a body to the Cilician frontier to be employed as a defence against the Greeks, who were then constantly at war with the Mohammedans along the skirts of Taurus. The *Jatán* and *Sagán* thus remained encamped about the pass of *Adana*, between the cities of *Tarsus*, *Mopsuesta*, and *Anazarba*, for above one hundred years. It was in A.H. 351 (A.D. 962) that the Greeks recovered for a brief period their footing in Cilicia, and one of their first acts was to remove into the interior, about Iconium and Cesarea, the fierce tribes who had so long harassed them on the frontier. As the Seljukians pressed forward into Asia Minor from the eastward during the twelfth and thirteenth centuries, it is probable that the *Jatán* and *Sagán* fell back before them towards the Bosphorus, and that at the beginning of the fourteenth century they crossed into Thrace. Shortly afterwards they first historically appear in Bohemia.

When it is considered that we are thus able to trace a large body of Indian colonists from the banks of the Indus to the shores of the Bosphorus, in an almost continuous series of movements; that the names of these colonists are everywhere given as *Jatán* and *Sagán*, which so nearly correspond with the terms *Gitano* and *Tsigani*, by which (under various corruptions) the Gipsies are universally known both in Europe and Asia; and that the Gipsies, wherever they are found, exhibit all those characteristic signs of language, colour, countenance, and habit which should belong to the *Jatán* and *Sagán* of history, it is hardly too much to say that the argument is complete, and that a very interesting ethnographical problem is thus fairly solved. Whether the large Gipsy population of Europe and Asia, now estimated at between three and four millions, can really have sprung from Bahram Gur's original colony, or whether we may not rather suppose that that deportation, giving a direction to colonization, was followed by the movement of large successive bodies of immigrants, is a question that may be left for future consideration. It is only further of interest to note that the ethnic name of *Room* or *Romani*, by which alone the European Gipsies designate themselves, arises from the long sojourn of the race in Asia Minor, the title of *Room* being applied by the Mohammedans of that age expressly to the Asiatic possessions of the Greek Emperor. The name is unknown to the Gipsies of Syria, of Turkish Arabia, and of Persia, these communities being descended from parties who must have broken off from the great body of the *Jatán* and *Sagán* in their progress from the East to the West, and before they reached the Cilician frontiers or came into contact with the Greeks.

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* The *Jats* are well known to all Indian ethnographers; they form at the present day the great mass of the population of the Punjab. The name of the Sacæ, or *Sagán*, is also preserved in *Sagistán*, now called *Seistan*, in *Deh Zangi* of the Paropamisus, *and in the* various *Zangáns* of Persia.

General Monteith stated that he had met with very numerous bodies of Gipsies both in Persia and India. He had at one time one hundred and fifty families of them under his orders, but they proved to be most intractable. He believed that one word in every thirty in their language was Hindostanee. Their faces much resembled those of European Gipsies.

The Gipsies of Madras are vagabonds in every sense of the word. Many of these were workers in small forges on the mountains between Arcot and Bangalore. They go out each with a small furnace, and bring home 10 lbs. or 12 lbs. of metal and sell it. They would then go off to some other trade; and when not occupied in this way, would spend their time in catching birds. He had seen twenty forges at work at once between Arcot and Bangalore, worked by the same body of men who afterwards went out bird-catching and hunting.

The Gipsies wander in black tents, from which they are called Karatchi in Persia and Turkey. General Monteith only saw three of their permanent villages; one at Erivan, Dokhergan, and in the Koflan Koh, near Miana, in Azerbijan. In the latter was said to be the Chief, recognised generally by all who came in contact with him. A few only remain in the villages during the summer.

With regard to the Gipsies in Persia, he would mention that a king of Persia, one of the Sassanian dynasty, had brought over 12,000 of them from Moultan into the empire, over which they were now spread. He thought that their numbers in Persia did not now exceed 3000 families. Altogether he believed them a most incorrigible race: they got lands without paying taxes for them.

Mr. Crawfurd, after remarking on the speech of Sir H. Rawlinson as to the origin and language of the Gipsies, went on to say that the large number of the Gipsy population was not surprising. He would compare them with the Jews, of whom from four to five millions were scattered over Europe—a much larger number than Palestine could ever have contained, even at its most flourishing period. He thought it important to remark that Gipsies are totally unknown between India and China. Their whole progress from Hindostan had been westward. The account which Sir Henry Rawlinson had given of their origin and history, he observed, was by far the most satisfactory he had ever heard.*

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* *See* Anti-Slavery Reporter, April, 1856, p. 76; also, 'Frontier Lands of Christian and Turk,' vol. i., p. 318. See also Dr. A. F. Pott's work, 'Die Zigeuner in Europa und Asien,' *Halle*, 1844, for a mass of information upon works alluding to the Gipsies, and for a copious vocabulary of their language.—Ed.

3. *Despatches from* Governor O'Connor, *dated May* 22, 1855, *reporting his Visit to the Island of Bulama, on the W. Coast of Africa.*

Communicated by the Colonial Office.

The island of Kanabak, or Canabec, situated in lat. 11° 16′ N., long. 15° 38′ 30″ W., has been and is the most important of the group forming the Bissago or Bijuga islands. In 1792 Mr. Dalrymple and a party of adventurers from England landed in Bulama, and induced the kings of *Kanabak*, "Jaborem," and "Bellehore" to cede the island to the *British;* but the natives of Kanabak attacked the settlers, carried off some women and Grumittas (blacks), and Mr. Dalrymple and the greater portion of his party returned to England.

Captain Beaver then took charge; but after struggling with many difficulties, having a weak and miserable material as colonists, and being under constant apprehension of invasion from his warlike neighbours, the Kanabaks, he abandoned the island, and sailed for Sierra Leone towards the close of 1793, 10,000*l.* having been expended in the attempt to colonise Bulama.

After this, the island became a principal depôt for slaves carried down the Jeba, Compance, Nuñez, and other rivers, and finally fell under the immediate control of a Senhor Gaetano Nazzalini, a notorious slave-dealer, whose family retains the remains of his property, houses and stores, which I found in charge of a Portuguese Jew. The British and Portuguese have from time to time disputed the sovereignty of Bulama, and played a singularly unprofitable game, the British and Portuguese ensign being hoisted alternately. The impression of the Captain-General of the Cape de Verde Islands and the officials of Bissao *at the present time* is, "that Bulama belongs to the Crown of Portugal by the prior claim of cession and settlement."

The island is about 15 miles in length by 5 in breadth, clothed with timber trees, but not densely wooded; a belt of palms extends along the sea beach for several miles, which is composed of hard, firm, red sand, and trenching gradually up towards the land.

The king only had a strip of cloth on him; the chiefs and people wore a clout of dressed deer or goat skin, the women using nothing but a cincture of grass or palm fibre over their hips. The natives are tall, athletic, with high regular features—the women particularly so: the colour a jet black; their bodies variously tattooed; but few wore charms or gre-gris on their persons.

A walk of 2 miles through a rich, open, arable country, with fine forest trees, and among many beautiful flowering shrubs and plants, novel to me, brought us to three of the principal kraals or settlements.

As is always the case in Western Africa, the king's chief village was placed beneath the shade of stupendous silk cotton, pullam, and other lofty trees: the huts were circular, larger, far better built, and neater thatched than any I had yet seen in Africa. A piazza enclosed each hut: the entrances were numerous, and singular devices were painted on the walls in blue, red, black, and yellow colours.

The Kanabaks are said to be descended from the fierce Giagas, and are Pagans; they rule over all the adjacent islands, have large war canoes, and are armed with bows and arrows, spears, swords, and muskets—the last of foreign and very old manufacture.

Kanabak is capable of yielding wax, hides, honey, rice, corn, ground nuts, and other produce in abundance. The cattle are of the finest kind among the Bijugas; and there is an inexhaustible material in *palm oil*. An adjacent island is prolific in cocoa-nut trees.

Kanabak holds a most desirable position, and is singularly fraught with many natural advantages. On the north-east side is a spacious roadstead, protected by the lofty headlands and bluffs of the island, and by the Isle del Porco, with a firm, safe anchorage in 9 fathoms, within ¾ of a mile of the shore. The beach is so easy of access, and slopes so gently to the sea, that puncheons of palm-oil or heavy articles might be rolled from the landing-place into boats or flats for shipment. On the south-east side of the island is an equally good harbour and the king's chief port; from it the Orango channel, 1¼ miles in breadth, leads to the Atlantic: this is the course used by the English and French men-of-war. Notwithstanding the ill-repute in which the Kanabaks are universally held for their savage, ferocious habits, plundering vessels trading to or wrecked on their islands, and massacring the crews, their indomitable hatred of white men, implacable resentment against their enemies, transmitting family feuds from generation to generation, and wearing the sandals of any relation killed in a quarrel on the anniversary of his murder till his death is revenged,—notwithstanding all this, I would not hesitate to reside among them.

Captain Miller stated that he had visited the Bissagos Islands in 1850 respecting the dispute as to right of territory between the English and Portuguese. The colony which was planted in 1792–3 on the island of Bulama comprised from two hundred and fifty to three hundred persons; but more than two-thirds of these were dead within a twelvemonth, owing to the unhealthiness of the spot, and the rest went to Sierra Leone. He did not think that such a large sum as 10,000*l*. ought to have been spent on the expedition. He believed that the Portuguese had a priority of claim rather than the British. When he visited Bulama he found three Portuguese soldiers, who insisted that the island belonged to Portugal. Some of Captain Miller's officers landed there, and found that these soldiers had cultivated various vegetables: the soil was very good; fowls were abundant; there was abundance of fish, and plenty of tobacco. From October to February the climate of the islands is as healthy as that of any part of the world; but after that it was as sickly as any part could possibly be. No attempt had been made since 1793 to colonise Bulama. The slave-trade had formed the chief support of the island. The islands are subject to the Governor of Cape de Verde. Another great obstacle in the way of colonising these islands, in addition to that of the climate, is the difficulty of navigation among them. It is very difficult to obtain a pilot, and no merchantman is sufficiently manned to be able to thread the intricacies of the passage. The conduct of the natives on the occasion of his visit was certainly fierce and warlike.

Captain FitzRoy referred to 'The Life of Captain Philip Beaver, R.N.,' by Admiral Smyth, in which his attempt to colonise Bulama is described at ull length. He had no doubt that 10,000*l*. were expended in the attempt.

A Visitor paid a personal tribute to the memory of Philip Beaver, saying hat there never was a more persevering man in the British service. He was not a man likely to abandon any enterprise he undertook. Only a very ew survived him.

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4. *Second Despatch from* Governor O'Connor, *dated October* 26, 1855, *reporting his Visit to the Casamance River.*

Communicated by the Colonial Office.

Entered the mouth of the Casamance river on the morning of the 21st stant—a *most difficult and* dangerous undertaking for vessels of any considerable tonnage, not steamers. Reefs of rocks and heavy breakers extend in every direction, and seem to render the entrance to the river almost inaccessible. Our pilot carried the 'Dover,' without the slightest hesitation or risk through the "Boca Grande," or Portuguese channel. The approach to the Casamance, the banks, and surrounding country present a most dreary desolate appearance; barren sand-hills, stunted dried-up jungle, and patches of land; dense groups of forest trees widely scattered; a total absence of all cultivation, inhabitants, or life of any description—the whole affording a melancholy type of African scenery. Five miles from the mouth of the river is the French settlement of "Carabane," situated on a small island of land surrounded with jungle. The town is composed of native huts, save the Resident's house, which is built in the form of a fort—the settlement being only a general depôt for exporting wax, ground nuts, rice, and country produce.

I had two interviews with the Resident, Monsieur Bocandé, a native of France, a gentleman of considerable acquirements, experience, and enterprise. Leaving Carabane, I reached the Portuguese settlement of "Zinguichor," 40 miles farther up the river—a collection of large mud buildings, stores and huts, constructed to the very edge of the water. Extensive rice plantations are adjacent to the town, and at no distance the impenetrable forest hems it in. A black man is Resident there. Rice, ground nuts, poultry, are exported from Zinguichor, but in very inconsiderable quantity compared with the natural resources of the settlement. From Zinguichor I continued my voyage up the river, wishing to arrive at the French settlement of Sejo (Segdhiou), the most distant European factory; but, after 40 miles, the channel became so confined, shallow, and irregular, and the banks so frequent on which the steamer repeatedly grounded, that I deemed it prudent to retrace my course, and not strain the machinery of the vessel.

5. *Letter from* Thomas Maclear, Esq., *Her Majesty's Astronomer at the Cape of Good Hope.*

Mr. Maclear transmits the original observations made by Dr. Livingston in his recent journey, having carefully recomputed them. The results of these observations, as roughly calculated by Dr. Livingston himself, have already been received. They were sent with a desire that they should be considered as *sub judice* until examined by Mr. Maclear.*

No pains have been spared in these reductions. Almost in every case the observed altitudes were compared with altitudes calculated from the times.

Mr. Maclear remarks that when a traveller takes lunars, it is very advisable that the *altitudes* should be omitted, and the labour of observing them handed over to repeated measures of distance between the moon and stars, *both east and west.* A practised computer can compute the altitudes in a few minutes.

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* *See* map in Journal, vol. xxv., which is corrected according to this latest in-

6. *Notes of a Journey from Baghdad to Busrah, with Descriptions of several Chaldæan Remains.* Accompanied by a Map. By WILLIAM KENNETT LOFTUS, Esq., F.G.S.

Communicated by the Earl of CLARENDON.

MR. LOFTUS travelled in 1849–50, in company with Mr. Churchill, from Baghdad to Busrah, while attached to the staff of Colonel (now General) Williams, on the Turko-Persian frontier. Their route lay east of the Euphrates, through a tract, of which only the N. part was at all known to Europeans. Their map is based on prismatic compass-bearings, carefully made, and then squared in between specified points on the banks of the river; these had already been fixed by the officers of the Euphrates Expedition. Minute details are given of the country they travelled over, and the various canals which are used for irrigation, are noticed. Attention is particularly drawn to the great effect produced by the Hindiéh canal, a branch of the river, in diverting the main stream from its natural channel, depriving the country on the E. of the Euphrates of its due share of irrigation, and frequently causing the inhabitants of the villages in the interior of Mesopotamia to abandon their lands. The Hindiéh passes through the Bahr el Nedjef, supplies what are believed to have been the *Paludes Babyloniæ*, and forms the Semava branch of the Euphrates. When greatly flooded, the Euphrates is liable to force for itself a wide mouth into the Hindiéh; to prevent which dams are constantly being constructed by the Pashas of Baghdad, and as constantly broken through by the stream, or else destroyed by the rebellious Arabs of the Khezail.

Mr. Loftus visited the following sites of ruins, which he describes:—Niffar; Hammam; Tel Ede; Wurka, to which he subsequently returned, in charge of an expedition sent out by the Assyrian Excavation Fund; and Mugeyer, since excavated by Mr. Taylor. He looked carefully for the Pallacopas, the canal of Alexander the Great, but, so far as he was able to extend his researches, without finding any trace of it.*

SIR HENRY RAWLINSON bore testimony to the merits of the paper: it was equally interesting both in a geographical and also an antiquarian point of view, and to do it justice in either respect would require a whole evening. He thought that Mr. Loftus possessed excellent qualifications both as a traveller and explorer, as shown not on this occasion only, but on many others. In fact Mr. Loftus might be called the discoverer of Wurka. He was the first to visit those remains, and he succeeded in exploring them more thoroughly after the French expedition, which had been supplied by their Government with every assistance, had pronounced success to be impossible. It was right to say that it was mainly owing to his character and abilities that Mr. Loftus was enabled, with no such advantages, to accomplish what he had done.

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* Mr. Loftus, in 1854, visited the marshes of the Khezail Arabs, and succeeded in making a careful map of the Western Euphrates from Semava to the Bahr el Nedjef. At the S.E. extremity of this great inland sea he observed traces of an ancient channel, which he believes to have been the *Pallacopas.* It must have flowed through the Khezail marshes, and passed considerably to the W. of the Mugeyer. The Arabs describe a deep river bed and several ruins upon its course.

The best existing maps give a very imperfect representation of the ancient condition of the country about the Tigris and Euphrates. The land consists of a soft soil, and the rivers consequently are always changing their beds. The channels of the Tigris and Euphrates are now very different from what they were anciently, and thus it is that all the ancient cities are now at some distance from the rivers. The population of the country was in former times almost entirely dependent upon the canals. He then called attention to a verse in the Bible (Gen. x. 25) which was translated so as to convey a false impression. " In his days was the earth divided " simply means that the land of Babylon was then first divided by canals, i. e., civilisation was first instituted, for cities could only exist after the water of the river had been distributed over their neighbourhoods by means of canals. The word " *Peleg* " is never applied to the division of one country from another, but almost always to the cutting of canals. It is certain that the whole country was once completely reticulated by canals. The Tigris and Euphrates supplied great branches, which in this way were made so to intersect the country that it became a complete garden; and although it is now an absolute desert, it might be restored by a system of canals, so as to become as fertile as it was in former times.

Sir Henry Rawlinson then proceeded to make a few remarks on some of the sites visited by Mr. Loftus. These, he said, were the sites of the earliest cities that we know of in the world. Four cities are mentioned in Gen. x. 10, viz., Babel, Erech, Accad, and Calneh; and it is mainly owing to bricks obtained by Mr. Loftus, that great discoveries with respect to these cities have recently been made. From bricks obtained at Niffar and other sites, it would appear that during the early period of history, i. e., about the twenty-fifth century before the Christian era, and from that period to the taking of Babylon, the country was inhabited not by a Semitic, but by a Hamite race—a race designated in the Bible by the name of Nimroud. Their language was cognate with the Scythian on one side, and with the African on the other. The people were, in fact, Cushite; their temples, language, &c. belong to *the Accadian race.* All the memorials obtained are Cushite, in a language more like Mongolian than anything else, and which has nothing to do with the languages commonly called Semitic.

The four cities of Genesis x. are the four recently described by Mr. Loftus. Niffar, which was probably the earliest capital of the country, was the ancient Calneh; Babel, of course, is Babylon; and Wurka was the ancient Erech. Accad is used in the inscriptions for the name of the people.

Niffar, in the centre of Babylonia, seems to have been the primitive capital of the whole country; it was dedicated to Belus, and was called the city of Belus by the Hamites. The name Niffar was given by Semites. When the Talmud was written, the old names were retained; its writers say that Calneh was Niffar, and they call the place Nineveh, but the Nineveh of Assyria was certainly at Mosul.

Niffar must be regarded as the most ancient city in the world. It was built by the earliest king of whom we have any monuments, but whose name cannot be read with certainty. In later times Babylon took the place of Niffar.

In the bricks of Wurka the name is not phonetically given: this, however, as before stated, is most probably the Erech of the Bible.

Mugeyer, described by Mr. Loftus, is a very interesting spot; it is most probably the *Ur of the Chaldees* of Gen. xi., from which Abram came out. There was a palace here, on the bricks of which occurs the name Chedorlaomer. Some of these bricks are now in the British Museum. Mugeyer gives the meaning to the word *Hebrew*, as applied to the Hebrew nation. One particular parish of this place was called Ibra, and probably from this spot Abraham came. No derivation of the word "Hebrew" is given in the Bible: it is said to come from a word meaning "over," because Abraham passed *over* the Euphrates: this cannot be true, as Mugeyer, i. e. Ur, was on the same side of the Euphrates as Palestine.

Sinkara is called Sarsa in inscriptions, and Hamman, visited by Mr. Loftus, is probably the Gulaba of inscriptions.

Mr. Loftus is almost the only European who has traversed that part of the country in which Hamman is situated. At Sinkara Mr. Loftus opened a temple of the Sun, from which he obtained some very interesting bricks.

A set of inscriptions from Mugeyer tells us who Belshazzar was. He was the son of Nabonadius, and was in command of the city of Babylon when his father Nabonadius was attacked by Cyrus. Nabonadius was defeated, and took refuge at Birs Nimroud, and hence when Cyrus attacked Babylon he met Belshazzar.

MR. LOFTUS apologised for the minute and uninteresting details of his paper, but said that he felt, as every point is of value to the traveller on a perfectly level desert, that nothing could be well omitted. A few additional words on Wurka he thought might be interesting, as it ranks amongst the largest ruins in the country. The walls of the city are 5½ miles in circumference, but many important mounds stand beyond the enclosure. There are at present three temples existing, one of which is perfect to the height of 25 feet, and exhibits on one of its façades some very remarkable peculiarities previously unknown in any style of architecture, so rude as to indicate their early origin. Wurka is moreover the most extensive Necropolis extant. Coffins and sepulchral remains occupy the whole of the central platform, piled up to the height of 30 feet; and he believed that, if excavations were made, they would be found to extend to the depth of 60 feet. The tablets from the ruins, which Sir H. Rawlinson has deciphered, are of the age of Seleucus and Antiochus the Great, 200 B.C. They are very interesting, as being the last known records with cuneiform inscriptions, and as having Greek names written in those early characters.

He desired to make a few remarks on the regions marked "Inundations" in the map. Those on the left bank of the Euphrates were owing to the construction of a dam which the Pasha of Baghdad had recently built at the mouth of the *Hindiéh Canal.* The inundation of Keffil, to which this canal leads on the W. of "the great river," is continued, after traversing the Bahr i Nedjef, to the S.E. through very large marshes, constituting what is strictly the main branch of the Euphrates. It is the one which is always used, and the only one which can be used at all seasons. Strange to say, this line of water communication is omitted in all our maps! It is always navigable, except when its entrance is dammed up by the Pasha of Baghdad.

Mr. Loftus, in answer to a question from Mr. Hamilton, remarked that the modes of burial were several: the earliest is that in which the bodies were placed in large pots, which were then covered with lids, and these were cemented down. Three or four bodies were often found in one coffin. About the time of our Saviour, the slipper-bath coffins probably came into fashion at Wurka. These were baked before the bodies were deposited in them. The dead were then placed on mounds and exposed. Drift sand covered them, and afterwards a new layer of coffins was placed above. This was the only way to account for these coffins being found piled one above another to so great a height. The coffins are very heavy, and it is most probable that they were brought to the mound before the bodies were placed within them.

Sir Henry Rawlinson said, in reference to these modes of burial, that the age of the different forms of coffins could be most easily traced. He should describe the earliest mode as one in which the body was literally trussed, like a fowl, and placed under a dish-cover. Many relics of this form are now coming home. The tomb might be described as a small platform of bricks, on which the body was placed, with a dish of dates, some corn, and a bowl of water. On opening these tombs, the hand of the skeleton is generally found in the dish among the date-stones.

The slipper-bath coffins were those fashionable at Wurka. They belonged most probably to the Parthian era.

The sepulchral jars are, however, the most extraordinary. He stated that he had seen hundreds of them containing skeletons, and the singular fact was, that the cranium is always larger than the neck of the jar. He had seen mounds composed entirely of such jars, and in no case can the skeleton be got out without breaking the jar. The jar must either have been moulded round the skeleton and then baked, or the neck (or bottom) must have been fastened on to the jar after the body was placed within it.*

GENERAL MONTEITH said, that when at Bushire, he had fallen in with many of these jars. He had never seen bodies in them, but only ashes and ornaments. The jars were much like common water-jars, about 18 inches high and a foot in diameter. The tops were fastened on. The jars were placed in caves, and he had frequently seen them imbedded in sandstone. Among the ornaments he had seen beads and a piece of brass, which had evidently been smelted.

ADDITIONAL NOTICES.

EQUIPMENT OF THE NORTH AUSTRALIAN EXPEDITION.

Extract from a Letter addressed to Mr. GALTON *by* Mr. BAINES, *Artist to the North Australian Expedition, describing the Particulars of its Outfit.*

The Party.—Commander, A. C. Gregory; Assistant, H. C. Gregory; Geologist, J. G. Wilson; Artist and Storekeeper, T. Baines; Surgeon and Naturalist, J. R. Elsey; Botanist, F. Müller; Collector, Natural History, &c. —— Flood; Overseer, J. Phibbs; Farrier and Smith; Harness-maker; Stockmen, European (9); Shepherds, Native (2).—Total, 21.

Provisions, &c. for 18 *Months.*—17,000 lbs. flour, 5,000 lbs. salt pork, 2,000 lbs. bacon, 2,000 lbs. preserved fresh meat in 6 lb. tins, 2,800 lbs. rice, 2,500 lbs. sugar, 400 lbs. tea, 350 lbs. tobacco, 350 lbs. soap, 50 lbs. pepper, 500 lbs. salt, 100 galls. vinegar, 300 sheep, 200 lbs. sago, 640 pints peas, 2 cwt. coffee, 500 lbs. lime juice, 6 galls. lamp oil, 1 lb. cotton wick, 3 cwt. preserved potatoes.

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* The jars to which Sir H. Rawlinson alludes are of Sassanian origin, and therefore of the latest date. Mr. Loftus met with them commonly during the excavations at Susa, in Persia; but they never occur at Wurka, or in any of the *more ancient mounds.*

Land Conveyance.—50 horses, 35 pack saddles, 15 riding saddles, 50 horse-blankets, 800 fathoms tether rope 1½ and 2 inch, 20 horse bells with straps, 100 pair hobbles, 3 light horse drays; 3 sets harness, 3 horses each; 50 spare girths, 50 yards strong girth web, 50 bridles, 10 pair holster bags, 10 pair stirrup leathers, 5 pair stirrup irons, 40 pair canvas pack-saddle bags, 100 straps, 200 buckles, 4 leather water bags, 20 pair spurs, 150 lbs. leather for repairs, 600 horse shoes and nails, 240 provision bags, 300 yards canvas, 20 lbs. sewing twine, 100 needles, 6 palms, 24 saddler's awls, 48 balls hemp, ½ lb. bristles, 6 lbs. resin, 6 lbs. bees' wax, 12 hanks small cord, 6 currycombs and brushes, 25 tether swivels.

Arms and Ammunition.—16 double guns, 4 rifles, 10 revolvers, 10 pistols, 200 lbs. gunpowder, 1,000 lbs. shot and lead, 30,000 percussion caps, 20 belts and pouches, 15 gun buckets, straps, locks, spare nipples, moulds, punches, 4 ladles, powder flasks, shot pouches, &c., for each gun.

Camp Furniture.—5 tents 8 feet square calico, 150 yards calico, 12 camp kettles (½ to 3 galls.), 6 doz. pannikins, 4 doz. tin dishes (small), 1 doz. large, 4 doz. knives and forks, 4 doz. iron spoons, 6 frying pans, 6 leather buckets, 6 water kegs (6, 4, and 2 galls.), 6 spades, 4 rocket shovels, 4 pickaxes, 2 spring balances (25 and 50 lbs.), 1 steelyard (150 lbs.), 1 sheep net (150 yards).

Instruments.—2 sextants (5 and 6 inch), 2 box do., 2 artificial horizons, 10 lbs. mercury in 2 iron bottles, 4 prismatic compasses, 11 pocket compasses, spare cards and glasses for compasses, 3 aneroid barometers, 4 thermometers to 180, 2 telescopes, 1 duplex watch, 1 lever watch, 1 case drawing instruments; 2 pocket cases, pillar compass, and protractor; surveying chain and arrows, 2 measuring tapes, 1 drawing board (30 × 40), 2 pocket lenses.

Stationery and Nautical Tables.

Tools.—1 portable forge, 1 anvil (½ cwt.), 2 hammers and set of tongs, 10 lbs. cast steel, 11 lbs. blister steel, 100 lbs. bar and rod iron, 3 smiths' files, 3 large axes (American), 6 small do.; 1 large tool-chest.

Clothing.—120 pair moleskin trowsers, 120 pair serge shirts, 120 cotton shirts, 20 pair boots, 40 oiled calico capes, 40 hats (Manilla), 40 blankets.

Artists' Materials.

Miscellaneous.—5 yds. mosquito net, green; 500 pot-hooks, 25 fishing-lines, 2 gross matches, 1 gross tobacco-pipes; 2 strong cases, for instruments, stationery, &c.; 8 doz. pocket-knives, 8 doz. pocket-combs, 20 yds. red serge for presents to blacks, 20 lbs. iron wire, 5 lbs. brass ditto, grindstone and spindle, coffee-mill, 3 iron saucepans, 2 iron kettles, 6 galls. linseed oil, 6 pints olive oil, 2 lbs. red lead, 23 lbs. alum, 1 lb. borax.

Forage for Horses and Sheep from Moreton Bay to Victoria River, 2200 miles, at 14 lbs. per diem.—13 tons pressed hay, 9 tons bran, 200 bushels maize or barley, 500 bushels corn for horses after landing.

Medical Chest for 2 years and 20 men.

Naturalists' Stores.

For conveyance across rivers, or navigation of any inland waters, a portable canoe of inflated canvas, in four sections, each of which, when inflated and laced to a frame, forms half a boat; the whole forming a double canoe, on which may be laid a platform of 15 feet by 7.

I subjoin some remarks written by Mr. Gregory before our arrival in Sydney. You will see that the increase of the party has rendered some alteration necessary, but I prefer giving it as I find it written.

REMARKS.

The Party.—The number of the scientific section is assumed at 4; they would have to perform those general duties as officers which the commandant might for the time being consider expedient.

Provisions.—The provisions are calculated to supply the party of 20 persons for 18 months, including only 50 of the sheep, which are so precarious a supply that they cannot wholly be relied on; but any consequent saving of salt meat could be carried to the credit of the expedition on the sale of the surplus stores.

I have never found kangaroo or other game to more than compensate for the ordinary losses contingent on accidents of a trifling character.

Land Conveyance.—Experience in Western Australia has shown that it requires two packhorses to carry the stores and provisions for each person comprised in an exploring party for the period of three months. The employment of drays, should the country be practicable for them, and the saving in weight of salt provisions, should the sheep prove available, would enable the party to carry on operations for a lengthened period without having recourse to the principal depôt for supplies.

Although bullocks would be less expensive than horses, and are preferable as a source of food, yet as they are incapable of supporting the same deprivation of food and water, and should any of the poisonous plants common in Western Australia be encountered, their loss would be inevitable, while horses are seldom if ever affected by it, I do not consider it would be judicious to employ bullocks on this occasion.

The form of pack-saddle generally used is unsuited for journeys of long continuance. The construction proposed to be employed is more simple, light, and durable, and is the only description I have employed to advantage.

Arms and Ammunition.—In the proportion that a party is prepared to resist aggression there is less probability of having to resort to extreme measures for defence. The principal portion of the lead would be carried in the form of shot, which is easily cast into balls when required.

Camp Furniture.—Light calico tents, though not very durable, are sufficiently so for the purposes of the expedition. The best form is a quadrangular pyramid, with one central pole; they contain 30 yards each.

Instruments.—Chronometers seldom prove of any service when carried on horseback; a good duplex watch is preferable.

A forge is required to shoe the horses on landing. A few bars of iron and steel can be formed into articles which must otherwise be carried in duplicate.

Conveyance of Party to Victoria River.—14 lbs. per diem of forage for each horse, and 2 feet 2 inches clear width of stall. The employment of the 'Tom Tough,' 150 tons, will enable the 'Monarch' to be dismissed as soon as she has landed the horses.

VIENNA GEOGRAPHICAL SOCIETY.

THE first meeting preparatory to the foundation of this new Society was held on December 1, 1855, at which Professor HAIDINGER delivered an introductory address.

He remarked that the French have a proverb "*L'homme est né marin*," by which they express a sentiment that is deeply rooted in human nature, but which few are able to indulge in after-life.

The learning of the scholar has no bearing upon tales of adventure or descriptions of remote countries; it takes scanty cognizance even of matters which immediately surround him; and the narrow cares and exigencies of practical life encroach more and more closely upon his natural tastes. But in countries where intellectual life is highly developed, many things may be accomplished by means of associated exertions which are totally beyond the reach of single individuals. Hence it is that the Imperial motto "*Viribus unitas*" has become a magic spell by which so many great and salutary measures have been recently called to light in Austria. Among these is the Imperial Academy of Sciences at Vienna. By its establishment a period is left behind, in which few scientific labourers are alone to be found, isolated and scattered here and there like so many oases over the face of a desert.

There is now a greatly-increased activity both in Geography and Geology,—so much so that it has become incumbent on Austria to take steps for extending her connections as far as possible, and in every direction. It is true that there already exist in Vienna a Military Geographical Institute for making Maps, and a Director-General of a department for the Survey of Lands subject to Taxes. Levelling operations are going on for the construction of railroads, roads, and canals. Astronomical observations are spread over the whole empire. A special Institute is ramified in every direction, which takes care of Meteorology and Terrestrial Magnetism; and the Imperial Academy of Sciences is the centre of the whole scientific movement within the Austrian monarchy. But there remains a special aim for the Vienna Geographical Society, namely, to take notice of the progress of geographical discovery in general, and particularly to keep alive the well-deserved interest for their compatriots who, constantly or temporarily, live in remote regions—whether for commercial enterprise, scientific progress, or in propagating the sacred tenets of Christian faith.

No sphere of action is more extended than that of a traveller; and he may justly expect to find within his country a centre from which his exertions are attentively followed, his successes cheerfully hailed, and his connections at home kept alive, to be renewed again on his return.

Professor Haidinger subsequently defines the object of the new Society as being "a voluntary centre of union for Geographical Interests"—*voluntary* as being open to all who are willing to declare their adhesion, and including under the term *Geographical Interests* every branch of natural science so far as they are connected with Geography, or may be subservient to the clearing up of Geographical questions.

Subsequently to the address, matters of business were proceeded with. The yearly contribution to the new Society was fixed at ten shillings (five florins), and preparatory meetings were arranged on the first Saturdays of the four ensuing months, to discuss rules and to receive communications upon Geographical subjects.

In the course of his address, Professor Haidinger showed at considerable length, the very favourable results that had followed the formation of Geographical Societies in other countries. At the same time he disclaimed all intention of a blind imitation of their proceedings, or any attempt at rivalry with them.

Abstract of a Paper on Animal Life in the Arctic Regions. By P. L. SIMMONDS.*

Read 1852.

MR. SIMMONDS's object is to show that the coasts of Greenland, the islands and shores of Baffin's Bay, the shores of the mainland, and islands to the north of the continent of America, abound with animal life.

At Whalefish Islands, Sir John Ross's officers used in the evening to shoot enough sea-fowl to supply all hands. In Melville Bay, Mr. Snow, in his account of the voyage of the 'Prince Albert,' says that in August there were innumerable quantities of birds. Mr. Penny filled two whaleboats with eggs from an island at the head of the bay. Wolstenholme Sound was found to be frequented by deer, bears, foxes, hares, lemmings, wolverines, and many varieties of sea-fowl. At Carey's Islands, 1000 loon were obtained in two days by the boats of the 'Assistance.' Dovekies and rotges were also abundant.

In Regent Inlet, and on Boothia Peninsula, Sir J. Ross, from 1829 to 1833, obtained quantities of animal food almost throughout the year. Whales, seals, and narwhals were numerous. The Esquimaux caught 18 or 20 seals in a couple of days. Two musk-oxen, and very many bears of large size, were killed. Hares and foxes were common food. Grouse, ducks, &c. were easily obtained. Salmon of one and two pounds weight were taken in the lakes by 4000 and 5000 at a time; and animals were equally plentiful at all parts of the Inlet.

While at Port Leopold in the winter of 1848-49, shooting parties of two men, from both the 'Enterprise' and 'Investigator,' were stationed at Whaler Point, and so plentiful were dovekies and loon, that a bird per man was served out regularly to the ships' crews: 4000 birds, yielding 2500 lbs. of meat, were shot, and more than 100 foxes caught. Between Cape York and Cape Cater, Captain Parker, of the 'Truelove,' caught 28 and lost 15 whales. He found the sea there literally swarming with life. The number of the larger animals excited unmixed amazement, while innumerable birds covered the water.

In Repulse Bay, Dr. Rae shot 162 deer, 200 partridges, besides taking two seals and some salmon, in the winter of 1846-47. He took with him four months' provisions, was absent 14 months and 23 days, and had at his return two-thirds of his original stock.

On the mainland, Sir J. Richardson, in the winter of 1848-49, collected 5191 fish, 13,810 lbs. of venison, 9220 of half-dry venison, 360 lbs. of pounded meat, 253 lbs. of reindeer fat, and 625 reindeer tongues. Mr. Isbister found no difficulty in supporting a large party near the mouth of the Mackenzie River from the fisheries only. In the barren grounds between Fort Enterprise and the mouth of the Coppermine River, Sir J. Franklin's party shot more than 200 deer in a very short time, and large flocks of wayveis were met with. The fishery at Fort Enterprise yielded 1200 white fish, weighing from two to three pounds each, and 40 excellent salmon and white fish were taken at a draught near the Bloody Falls. Geese and ducks were abundant, and about two dozen musk-oxen and a bear or two were also killed.

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* This may be considered supplementary to a paper on the same subject, *printed in the 'Journal of the Royal* Geographical Society,' 1852.

At Bathurst Inlet and Arctic and Melville Sounds many deer were shot [illegible] and bears and seals were plentiful. Capeline and herring were extremely [illegible] numerous, with a variety of other fish. Swans, cranes, and grey geese were [illegible] also killed.

To Victoria and Wollaston Lands Sir J. Richardson says the deer migrat[illegible] in large herds in the spring, and return to the main in the autumn. The[illegible] are the breeding-places of vast flocks of snow-geese; and seals are numerous. There also Dr. Rae, in 1851, found many partridges; deer wer[illegible] very numerous, and many hares were seen. He found the Esquimaux very fa[illegible] having killed plenty of seals. They kill the whale near the different headlands of the coast, as Sir J. Richardson informs us. At Garry Island, off th[illegible] mouth of the Mackenzie, he found numbers of moose and reindeer, foxe[illegible] gulls, dotterels, geese, cranes, and swans. In the autumn from 300 to 4[illegible] herring-salmon were caught daily, with carp, trout, and other fish.

At Icy Cape, Capt. Beechey, in the 'Blossom,' fell in with numerous floc[illegible] of ducks, consisting entirely of young ones and females. The Esquimaux h[illegible] great quantities of oil, blubber, skins, and dried salmon.

On Herald Islands innumerable flocks of black and white divers depo[illegible] their eggs and bring up their young.

On the Parry group, in 1819-20, animals were very numerous. Sir [illegible] Parry's hunting parties in a few excursions obtained 3 musk oxen, 24 de[illegible] 63 hares, 53 geese, 59 ducks, 144 ptarmigan, amounting to nearly 4000 lb[illegible] of meat; one of the musk oxen weighed 700 lbs. Here also M'Clinto[illegible] during his remarkable journey killed 4 oxen out of about 50 seen, 1 reinde[illegible] out of 34, 2 bears, 1 wolf, 7 hares out of 80 or 90 seen, and 20 ptarmiga[illegible]; and he remarks that, "had it been his object, he could easily have shot tw[illegible] thirds of all the oxen he saw;" the other animals were remarkably tame.

Austin Island, the shores near Cape Walker, Beaufort, Bathurst, an[illegible]d Cornwallis Lands, and Wellington and Victoria Channels, also abound wit[illegible]h animal life. Captain Penny especially mentions bears, seals, reindeer, wal-ruses, hares, with thousands of ducks and sea-fowl. In a short journey, 3[illegible]8 ptarmigan, 4 bears, 3 seals, 1 walrus, 14 hares, 1 reindeer were killed; of the[illegible] latter about 30 were seen, and 35 bears.

The following is the list of animals, &c., killed by the crews of the 'Assist-ance' and her tender 'Intrepid' in their cruise of 14 months after leaving[illegible]g Whalefish Islands previous to their return home:—13 bears, 22 foxes, 9 hares, [illegible]s, 4 musk oxen, 1 deer, 3 lemmings, 1 seal, and 2 narwhals. These were all in [illegible] in good condition; the hares weighing about 10 lbs. Of birds, 15 king ducks, 4[illegible]15 eider ducks, 20 long-tailed ducks, 1 brent goose, 82 ptarmigan, 6 willow[illegible]w grouse, 4 phalaropes, 1 ring dotterel, 19 snow buntings, 10 curlews, 108[illegible]0 loon (none of these latter were seen W. of Griffith Island), 225 dovekies, 1[illegible]0 lestries, 1438 rotges (these latter were not seen out of Baffin's Bay), 8 burgo-masters, and 240 other birds, as ivory and silver gulls, puffins, terns, &c.; i[illegible] in all 3174 in number.

ERRATA IN PROCEEDINGS, No. I.

Pages 8 and 10, *Fuga*, not Faga: p. 11, *Matiamvo*, not Matiamovo: p. 13, *Dr. Hov*[illegible], not Dr. Honse: p. 15, *Gujeba*, not Gugeba: p. 17, line 2, 1853-4, not 1852-3 [illegible] 4; and in line 6, 1853, not 1850: p. 24, *Winniatt*, not Winniett.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1856.

Eighth Meeting, April 14, 1856.

REAR-ADMIRAL F. W. BEECHEY, President, in the Chair.

Mr. James Hogg, Jun., was elected a Fellow.

ANNOUNCEMENTS.—The PRESIDENT announced the appointment of Mr. Andrés Poey as director of the Meteorological Observatory at the Havanna, and read a letter from Mr. Frere on the progress of Mr. Hahn. Mr. Hahn, the Rhenish missionary, had left Cape Town for Walfisch Bay, with the intention of proceeding thence, overland, to Mossamedes. Letters had been written to the Portuguese governor of that province, recommending Mr. Hahn to his Excellency's care and protection.

MR. GALTON remarked that the embouchure of that river, which forms the northern boundary of the Ovampo, had recently been explored; and it was Mr. Hahn's desire to settle near it, and thence to make such expeditions along its course as might be found practicable. This river appears to offer the shortest and healthiest high road to the interior, the whole coast on either side of its mouth being entirely free from fever. Mr. Hahn had been a missionary among the Damaras and Namaquas for about ten years, and there is perhaps no one person in South-West Africa, who has had more personal influence over the natives, or who has done more to repress their barbarous outbreaks than he.

DR. HODGKIN announced the death of Philip Schönlein, Ph. Dr., the only son of the physician to the King of Prussia, one of the most distinguished Professors of Medicine in Europe. The young man was devoted to travel; his chief object was to explore the eastern part of Africa, but having come to this country to further this object, he thought it might be well to take advantage of an opportunity which arose of visiting the West coast. He therefore went to Cape Palmas, a colony of the Maryland Colonization Society, where he died on the 8th of January of the present year. He had been there a few months, and has sent an interesting account of the state of the colony.

The Papers read were—

1. *Letter from* Dr. SUTHERLAND *to the Secretary.*

DR. SUTHERLAND remarks that he had visited the whole district of Natal while employed as Government geologist; that he has for ten months been *fulfilling* the duties of surveyor-general; that the S. W.

oundary of the district is about to be surveyed, and that the N. W. is nder consideration. He has established three meteorological stations, nd is engaged in forming two others, and he relates some of the many nquiries in which he has found time to occupy himself. " There are ew ridges in Natal on which the mountain barometer, lent me by the ociety, has not been read in connection with geological sections and stronomical observations; but, alas! it has been my fate hitherto only o look at a pile of unfinished work and unreduced data, which are very day on the increase."

SIR RODERICK MURCHISON referred to the excellent qualifications of Dr. utherland for the office of Surveyor-General of Natal, which he now holds n the place of the late Dr. Stanger, of the Niger Expedition; having been ppointed to that post by Sir W. Molesworth on his, Sir R. Murchison's, ecommendation. Dr. Sutherland is well known to geographers through hi oyages and his work on the Arctic regions. Much may be expected from hi esearches, and there can be no doubt that he will effectively develope the ver emarkable natural features and products of the region in which he is no laced.

2. *Letter from* Mr. GABRIEL, *H.B.M. Arbitrator at Loanda, reporting the Progress of Dr. Livingston.*

Communicated by the Earl of CLARENDON.

I HAVE just received a letter from Dr. Livingston, dated the 12th f August last, announcing his safe arrival at Naliek, in the Borotsé ountry, distant from this place about 800 miles, and, according to the ap which he was good enough to give me, showing his route from he Zambesi to Loanda, lying in latitude about 14° 30′ S., and longi- ude 24° E.

" This letter, the only one which Dr. Livingston wrote from Naliek, as entrusted to the care of some native traders whom he met at that lace, and by them delivered at Pongo Andongo, a Portuguese ettlement in the interior of this province, whence it was immediately orwarded to me by the Portuguese authorities. It conveys the pleasng intelligence that, after having surmounted all the perils and hardhips which presented themselves in his progress through the hostile ribes of the Chiboque and Balonda, and overcome the opposition of native chief in crossing the river Casai, he was, to use his own words, at home, received with enthusiasm at all the different towns and villages through which he passed, and wanted for nothing the people had o give.'

" He had been detained ten days at Naliek, waiting the construction f canoes with which to descend the Zambesi, but was to start the day fter the date of his letter to me; and, having the stream of the river in is favour, he expected to arrive at the Chobé in fifteen or twenty days.

"Notwithstanding all the sufferings which he had undergone in the earlier part of his journey, Dr. Livingston, I am rejoiced to say, informs me that, on the date of his letter, he was, through the merciful providence of God, in as good health as he ever enjoyed in his life, adding, 'You will be pleased to learn that my men are all in high spirits, and quite prepared for another trip, although, as we have had to sell almost everything for food, they have but little to show after their long absence from home.'"

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3. *Letter from* Commodore Trotter *to the Secretary of the Admiralty, on the Result of Inquiries made at Quilimane respecting Dr. Livingston.*

Communicated by the Admiralty.

"In reference to your letter of the 5th March last, No. 25, conveying to me their Lordships' directions to order the commanding officers of any cruisers, in the Mozambique Channel, to make inquiries at Quilimane respecting the Rev. Dr. Livingston, who was expected at that place in November last from across the continent of Africa, I request you will inform their Lordships that H. M. S. 'Frolic,' during her late cruise in the Mozambique, called twice at Quilimane, in October and December, but that Commander Nolloth was not successful in obtaining intelligence of this enterprising traveller.

"H. M. Brigantine 'Dart' (tender to 'Castor'), under the command of Mr. James P. M'Clune, second master, now on the eve of departure from this port for the Mozambique, is ordered to proceed to Quilimane, to afford the Rev. Dr. Livingston all the assistance he may require, should he have reached that place; but in the event of his not having arrived, the 'Dart' is to cruise for the suppression of the slave trade and the protection of commerce, the Commander leaving a letter for Dr. Livingston, stating when he will be back, and taking care not to be absent from Quilimane more than three weeks at any one time.

"Dr. Livingston is to be offered a passage to the Cape of Good Hope in the 'Dart' if he wishes it.

"Commander Nolloth, of H. M. S. 'Frolic,' reports that his Excellency the Governor of Quilimane has caused every arrangement to be made to ensure the comfort of Dr. Livingston and his safe arrival on the coast, whenever he may place his foot within the Portuguese territory."

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4. *Letter from* Commander NOLLOTH *to* Commodore TROTTER, *with Enclosures.*

Communicated by the ADMIRALTY.

" . . . . The Governor assured me that he had given ample directions, providing for Dr. Livingston's welfare, should he make his appearance at Teté; and that he had ordered his own dwellings at that place, and at Senna, to be placed at his disposal; and he was good enough to say that he would send still further directions."

Commander Nolloth encloses a detailed statement of the time occupied in voyages and journeys between Quilimane and Teté at different times of the year. The most favourable voyage *down* river occupies three days, and the most unfavourable voyage *up* river forty days.

He also sends a translation of the Mozambique Government Gazette of March 17th, 1855, containing a few of the names of the places through which the Moors passed, who journeyed from Zanzibar to Benguela and back again to the East Coast by a different route. They left Benguela June 7th, 1853, and arrived at Mozambique November 12th, 1854.*

5. *On the Causes of Dryness in certain Arid Districts.* By THOMAS HOPKINS, Esq., of Manchester.

MR. HOPKINS examines into the nature and causes of those winds which blow in regular directions. He argues against the principle of the Hadleian theory, and disputes many facts commonly advanced to sustain it. He denies any general and obvious movement of the atmosphere from the polar to the tropical regions, and asserts, on the other hand, that all regular winds blow to one or other of the following places—they being the great mountainous districts of the globe, which arrest vapour and produce heavy rains, and which he calls " areas of condensation:"—the Andes, the Himalaya, the lofty islands of the E. Archipelago, and the snow mountains of Tropical Africa. Other mountains produce similar effects, but of secondary importance.

Mr. Hopkins' hypothesis is that mountains condense vapour from the air that surrounds them—that this process of condensation liberates heat which raises the temperature of the air—that a partial vacuum results from this condensation and heating, which is filled by indraughts of air from all sides. These create ascending vortices, and cause a boiling up and an overflowing of large masses of the atmosphere in the higher regions; here they diffuse themselves, and in time descend, perhaps in far distant places, or they may press upon and put in motion the air that lies beneath them. As the wind passes from colder latitudes to any one of the above-mentioned "areas of condensation," which happen all to be in the tropics, it acquires, from that cause alone, a greater capacity for dissolving vapour, and becomes a drier wind. If it passes over the sea, it supplies itself with moisture in its passage; but if over a continent which yields little evaporation, the farther it travels the drier does it become.

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* *For further* particulars about their journey, See p. 75.—ED.

The mountainous and rainy promontories of South America, South Africa, and Van Diemen's Land, have a special influence upon the dryness of the winds which blow over them to the northwards, for they abstract a large portion of the vapour which they would otherwise have carried along with them.

From this reasoning Mr. Hopkins would conclude that every country which lies between the above-mentioned "areas of condensation," and any great extent of continent stretching towards colder latitudes, is necessarily traversed by a dry wind, and thereby becomes arid and desert. It is thus that he accounts for the deserts in either hemisphere.

He concludes by hoping that future travellers will not omit to observe the force, direction, and moisture of the wind in the various countries they visit. Observations made at sunrise, and again at the hottest time of the day, say between one and two o'clock, would be of value.

Mr. Hopkins' paper is of considerable length, and enters minutely into details respecting the physical features that influence the aridity of each desert tract.

CAPTAIN FITZROY said that the subject of the paper was too difficult to be dealt with in a short space of time. He could wish that the paper had been divided into distinct heads, so that each might be more easily referred to. With the main argument of the paper he should take issue at the very outset. That argument was based on the assertion that "*condensation of vapour causes a vacuum.*" Now, some of the ablest men who had studied the effect of the presence of aqueous vapour upon the weight of the atmosphere, had come to entirely different conclusions respecting it. Whether therefore aqueous vapour adds to or diminishes the weight of the atmosphere, is a disputed point. Some *add* a correction to the weight of a column of air, on account of the vapour included within it; while others (and a very large number) contend that this very correction ought to be *subtracted* from the weight of the given column. That no vacuum is produced by the condensation of aqueous vapour in the atmosphere is shown by the barometer, which does *not sink* after a fall of rain, but, on the contrary, *rises*, showing that the atmosphere has become heavier. Where moving masses of air meet with high lands, there is no doubt that their moisture is condensed: therefore it is that the windward side of mountains is usually clothed with forest, and abounds with water, its fertility being consequent upon its rainy climate, while the opposite side is characterized by dryness and by a clear sky. Among many examples that might be given, he would instance the Galapagos Islands (a group in which the evidence of volcanic agency was very abundant); here the wind is perennial, from the eastward; consequently, the windward sides of the mountains on these islands are covered with forests to their summits, while, *on the opposite sides, the lava is still as sharply edged as it ever was, cutting the shoes of those who walk over it.* The whole subject of atmospheric circulation is, as has been said, very difficult; it is yet "an overwhelming mass of detail, which we have not sufficient light to penetrate sufficiently."

MR. GALTON objected to certain data, regarding South Africa, upon which Mr. Hopkins had argued. He described that continent, up to the 6th degree of S. lat., as being low and arid, whereas the fact is the very reverse. The height of the table-land of South Africa was great: at Lake Ngami it was 3800 feet, and at the sources of the river that fed it from the north it was necessarily greater; in Damara-land it far exceeded 4000 feet. Again, the Karri-harri desert and those portions which lie S. of a line joining Delagoa Bay and Great Fish Bay are undoubtedly arid, but, to the northward of that line, such enormous quantities of rain fall that the country is at times impassable. Lobale and the Borotsé Valley are deluged with water, and their villages are built upon mounds to preserve them from floods. The streams of different water-sheds are described as interlacing, and, even in Damara-land, the country suffers more from excessive alternations of seasons than from actual drought. Thus, during a rainy season, an hippopotamus has actually travelled overland from Omanbondé to the Swakop, across a tract which, in the dry time of the year, was utterly destitute of water except in a few wells and scanty springs. Farther to the N. we find the great lake Nyassi, to which so much attention has been recently drawn; and, he would add, in corroboration of its extent, and especially of the great bend from E. to W. which Mr. Erhardt believes to exist, and which appears upon his map, that in a route of Arab traders * across the continent, out of about 100 stages, whose name they record, 17 have the prefix of Niassa, by which we may roughly infer that that proportion of their entire route from E. to W. lay alongside this bend of the lake.

MR. HOPKINS explained that he had stated in his paper that South Africa was not so dry as Patagonia or Peru, and that in this respect its character was not so strongly marked as that of the other continents of the S. hemisphere. He thought that an elevation of 2000 feet, or even 4000 feet, for the table-land, would not be sufficient to arrest the vapour so as to produce a large amount of condensation; much of it, therefore, passed on to the mountains near the equator, which are, say, 15,000 feet high.

6. *Removal of Pitcairn Islanders.*

The PRESIDENT (Rear-Adm. BEECHEY) remarked upon the interest which the English have taken in these islanders, and upon their recent removal to Norfolk Island. He thought they would exercise a most beneficial influence upon the inhabitants of the neighbouring islands of the Pacific, who have but recently, if at all, emerged from a state of barbarism and even of cannibalism.†

The BISHOP of OXFORD, F.R.G.S., quite agreed with the President as to the great importance of this removal of these people to Norfolk Island, and trusted that it might be productive of all the good he anticipated. He called attention to the remarkable manner in which the work of self-purification had proceeded among them, although all external influences seemed adverse. Their chastity, and their strictness with regard to property, were points worthy of the deepest admiration, subjected as they had always been to the evil influences arising from ships' crews landing on their island. Seeing that they had gone on so favourably under such adverse circumstances, it could not but be hoped that they would exercise a very beneficial effect upon others around them, when they were countenanced and helped by the British Government. By their removal, a new centre of religion and civilization would be placed in that quarter of the world; at the same time it was an experiment attended with no little risk. Their present virtues were connected with a certainly child-like cast of character, and in a fertile island, and under new circumstances, they would be exposed to a wholly new set of temptations.

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* *See* p. 75.

† See p. 77.

Sir Thomas Fremantle, F.R.G.S., stated that he had received some very interesting accounts of the Pitcairn Islanders from his brother Captain Fremantle, R.N., of H.M.S. 'Juno.' His brother, who was the chief officer on the Australian station, had been directed by the Admiralty to send a ship to Pitcairn's Island, to propose to the inhabitants, from the Government, that they should be removed to Norfolk Island. Having nothing to engage him particularly, he went himself in the 'Juno.' The account he gives of the people quite comes up to all that had previously been said of them. They were especially remarkable for their simplicity of manners and for moral and religious principles. On his arrival, Captain Fremantle assembled in their church the whole population of the island, amounting to about 180, in number, of both sexes, and read the proposal to them. They listened with respectful attention, and discussed the matter with great good sense among themselves. Being convinced that their own island was no longer large enough to support them, they determined to accept the offer, cordially thanking the Government. Some few, who hesitated at first, signed the paper next morning. There was one remarkable condition which they had asked, but which it would probably be extremely difficult to accede to: it was, that as they had always lived happily without the access of strangers, the British Government would grant them the privilege of keeping exclusively to themselves the possession of Norfolk Island. Sir T. Fremantle regretted that he was not prepared to afford more detailed information to the Meeting from the interesting letters of his brother, but some months had elapsed since he had read them, and he was not aware that the subject would be adverted to at the Meeting.

Ninth Meeting, April 28, 1856.

Rear-Admiral F. W. BEECHEY, President, in the Chair.

Mr. Josiah Berry; Rev. A. Clive; Lieut. C. A. C. De Crespigny, R.N.; *the Chevalier A. Duprat (of the Cape of Good Hope); Mr. William Ferguson; Mr. Alfred L. Halloran,* R.N.; *Mr. A. R. Johnston,* F.R.S.; *Mr. Charles Lee; Dr. Macpherson,* M.D. *(Inspector-General of Hospitals, Kertch); Mr. Frederick North,* M.P.; *and Mr. Joseph Hall Worthington, were elected Fellows.*

The Papers read were—

1. *On the Current along the Coast of Greenland.* By Commodore C. Irminger, of the Royal Danish Navy.

He argues that the current which leaves Spitzbergen and runs along the coast of East Greenland, does not travel thence, in a straight line, towards the banks of Newfoundland, but that it turns round Cape Farewell and runs north to the 64th, or even 67th, degree of lat.; then, *passing, westward, to the* opposite side of Davis Straits, it falls into the current from Baffin Bay, that runs southwards along the coast of Labrador. Commodore Irminger bases his arguments upon quotations from the logs of twenty voyages; by which he determines the limits of the ice carried by the current. He also remarks that the existence of this ice is well known to the captains of Danish vessels, who habitually shape their course so as to avoid it.

MR. A. G. FINDLAY, F.R.G.S., said, that the only traveller who had given any information as to the currents on the S.E. coast of Greenland, from personal observation, was Captain Graah, of the Danish Navy, in 1829-30. He particularly mentions* that no current is observable on the shore, but that outside the vast accumulation of ice which is pressed on to it, there is a set to the S.W.: this, however, he states from other authority. That there is a set from the N.E. towards Cape Farewell can scarcely be doubted, from the facts of the drift of the wreck from the Dutch fleet in 1777 † and other vessels in that direction; but this may be caused by a temporary and not a permanent current between Iceland and Greenland.

There are one or two circumstances which bear strongly on the subject, and corroborate the views of Commodore Irminger. A plank of mahogany was drifted to Disco many years ago, and was formed into a table for the Danish governor of Greenland at Holsteinborg.‡ Admiral Löwenörn also picked up a worm-eaten mahogany log off the S.E. coast of Greenland. The inference is that these came from the S.W., from the West Indies; and their course will confirm the facts quoted by the author. This current round Cape Farewell to the W. and N. has been described by Sir James Ross, § Dr. Kane, and other later voyagers, but the present paper threw great light on its character.

2. *Letter upon the Bonin Islands, from* Captain QUIN, R.N., F.R.G.S., *to the Admiral in command of the India Station.*

CAPTAIN QUIN visited these islands, in command of H.M.S. 'Raleigh,' in 1837. He found the inscription left in 1827 by the President (then Captain Beechey, in command of H.M.S. 'Blossom') on Peel Island, when he took formal possession of the group. Captain Quin's letter gives a succinct account of what had befallen the islands since that time. In 1830, they were first settled under the British flag; and, up to Captain Quin's visit, nine vessels (seven of which were English) had touched at them, and lost a few deserters out of their crews. In 1837, Captain Quin erected a substantial flag-staff on Peel Island. He found there much cultivation of all kinds of produce. There was an abundance of pigs, and some of these, as well as goats and poultry, had run wild and multiplied in the woods. The island was well timbered, and free from snakes and other noxious animals. Not the least vestige of previous occupation had been discovered by the settlers.

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* Narrative, &c., pp. 113, 114.

† Capt. W. Scoresby, 'An Account,' &c., pp. 216, 217. [Commodore Irminger quotes the 'Accounts of the Whalers in 1777, by Larens Hansen, Director of the School of Vibé,'—a town in Denmark.—ED.]

‡ '*Quarterly Review*,' No. 36.

§ *Vide* Captain Graah's Narrative, p. 24, &c.

The **President** said that this group of islands was interesting from the growing importance of steam navigation in the Pacific Ocean. The islands themselves are insignificant, but, from their situation, they may become very important as a coaling-station for vessels trading between America and China. Commodore Perry had pointed out their importance in this respect. The priority of discovery is, according to that gentleman, a matter of question between Great Britain and America. The Commodore had blamed him for not giving the credit of discovery to a (supposed) American captain, who is said to have seen the southern group of the Bonin Islands; but the islands, referred to in this statement, were situated to the S. of the Bonin Islands, and some of them, especially Sulphur Island, had been seen by Captain Cook, and others, before the Americans became an independent nation. When Admiral Beechey took possession of these islands in 1827, he had no knowledge that Captain Coffin had seen any of them.* At that time, he found only two seamen upon them; the population has since considerably increased.

3. *On the Connection between the Atlantic and Pacific Oceans, viâ the Atrato and Truando Rivers.* By Mr. F. M. Kelley, of New York.

In describing various routes for effecting the long-desired junction of the Atlantic and Pacific, through the great American isthmus, Baron Humboldt had, fifty years ago, pointed to the river Atrato, and to the depressions said to exist in the mountain range between that river and the Pacific. Captain FitzRoy and others had also contributed more recent information on the same subject in the Journal of the Society; but, up to the year 1852, no actual surveys had been attempted. In that year, Mr. Kelley of New York, and other gentlemen, despatched a surveying party, under Mr. Trautwine, C.E., to survey and level the Atrato to its sources, and to pursue the work across the dividing ridge, and along the most practicable waters, to the Pacific, with a view to the construction of a ship canal. Mr. Trautwine, with his party, surveyed the mouths and course of the Atrato, and extended his inquiries along its western branch, the Quito, and across the dividing ridge, along the Baudo and the San Juan, to the Pacific. The Raspadura Canal, which was said to connect the Atrato and the San Juan, was unknown, and, if it ever existed, could have been nothing more than a canoe-slide between two streams. During the journey "astronomical observations for latitude were made as often as the usually obscured state of the heavens would allow. Altitudes were taken by the spirit-level and barometer; the width of the river, by angles from a measured base; and distances along the streams, by repeated observations of the rate of the boats' passages." This survey was immediately followed by two others, despatched at Mr. Kelley's sole expense, under Mr. Porter and Mr. Lane, civil engineers, accompanied by assistants, and fully equipped.

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* *See* R. G. Soc. Journal, vol. xxv. p. cxiv.

These expeditions confirmed the observations of Mr. Trautwine, and proved that no ship canal could be constructed from the head-waters of the Atrato to the Pacific; but the information acquired, induced Mr. Kelley to despatch Mr. Lane on a fourth expedition, to survey the Truando. Mr. Lane ascended that river and reported favourably, but sickness prevented him from crossing to the Pacific. Mr. Kelley, therefore, sent a fifth expedition, under Captain Kennish, an English engineer, accompanied by Mr. Rude and Dr. Jameson, with others, to proceed to the Pacific, and trace the coast from the Bay of Panama southward to 7° north latitude. If a harbour could be found, the interior was to be explored; and if the mountain range presented sufficient depression for a canal, the expedition was to carry its surveys through to the Atrato. Captain Kennish found a harbour in the bay, terminated on the south by Cape Marzo; and here, also, he observed the Cordillera to be diminished in height from thousands to, only, hundreds of feet. On crossing the water parting he struck the Nerqua, a tributary of the Truando, and from thence the party descended in boats to the Atrato. His survey and levellings have resulted in a plan for a ship canal, without a lock or any other impediment. After crossing the bar, which must be removed, the Atrato maintains a depth of 47 feet up to the Truando, and a width of 750 to 1000 feet. The Truando is navigable for thirty-eight miles from the confluence; and the remaining twenty-five miles to the Pacific will require cutting and a tunnel of three-and-a-quarter miles. Mr. Kelley regards the connection of the two oceans as a work of too great importance to be undertaken without full and authoritative investigation of an international character. Having carried the investigation thus far, he is now desirous that the question of uniting the two oceans, which has been discussed ever since the Spanish occupation of America, should be settled. The immense increase of commerce between the Atlantic and Pacific, following the discovery of gold, renders the subject now of pressing importance. The United States Government is willing alone to proceed with the survey; but European interests ought also to be represented. The English Government is not unwilling to co-operate; and all that is required, to insure the national survey of the practicable routes between the oceans, is the establishment of cordial relations between the Governments of the United States and Great Britain.

The PRESIDENT, in inviting discussion on this paper, observed that several plans had been proposed to establish lines of traffic between the two great oceans, but that all had as yet been found too difficult of execution, with the single exception of the Panama Railway. The route for a ship canal, which Mr. Kelley had proposed, appeared to possess so many advantages, that that gentleman had come over from America in order to make it known. There were three questions which the subject naturally suggested:—the *financial*; the *engineering*; and the *hydraulic*, as to whether a sufficient depth of water could be obtained for ships to pass from the Pacific, down the Atrato, into the Atlantic Ocean; and he would call especial attention to the last point.

Captain FitzRoy, F.R.G.S., said that the subject of the connexion of the two oceans was one of the most important that could be brought before the Society, as it involved the interests not only of Europe and America, but of the whole world. To discover the means of effecting it, so as to afford a passage for the largest ships, was the most practically useful problem in geography in the present day. It had occupied attention from time to time during the last three hundred years, but especially during the last half-century; so that now it was easy to obtain a mass of details, respecting most portions of the isthmus of Central America, without leaving one's own country. In former discussions before the Society, two projects for canals had been mentioned. One of these was from the Gulf of San Miguel to Port Escoces; the other from the mouth of the Atrato to Cupica Bay. Humboldt had pointed out the advantages of Cupica Bay, and the comparatively easy line of communication between it and the Napipi River. Since then, Cupica Bay had been surveyed, and had been found to be one of the best harbours on that part of the coast. Commander Wood, F.R.G.S., who surveyed it, stated that he landed from his ship in Cupica Bay after breakfast, walked from the coast across the ridge, bathed in the Napipi, and returned before 12 o'clock. In his opinion, the dividing ridge was not more than 400 feet above the sea level. The communication, therefore, in this part would be comparatively easy; but whether this route or that between Humboldt Bay and the Truando, as pointed out by Mr. Kelley, be the more practicable, can only be determined by an accurate survey of each. The difficulty resulting from the climate, would apply equally to all the proposed plans. It is excessively wet nearly all the year round. Only two or three months are free from excessive rain; yet those who have been much exposed to it have suffered but little, as the experience of Mr. Kelley's exploring parties testifies. Those who have crossed the isthmus in various places also report favourably of the comparative healthiness of the climate. The two precautions necessary to be taken, are, to provide abundant shelter and wholesome food for those engaged in it. The settlers at Port Escoces failed, entirely on account of their neglect of these two simple precautions. Humboldt, who is the best authority on the whole of this region, and who collated all the trustworthy accounts of it which he could find, is of opinion that the route from Cupica Bay, along the Napipi, is the one offering the greatest facility for a ship-canal. The fact that three lines, each offering a probability of success, are now proposed to the world, furnishes a strong argument that an expedition should be undertaken to effect a more complete survey. The matter is one that affects, in a greater degree, the rising generation, as the work would take a great many years to carry out; but a beginning should be made by ourselves. Like the Panama railway, it would probably be found, eventually, a much more practicable undertaking than it is generally thought to be. That railway now pays well; ten years ago, the attempt to construct it was by many deemed chimerical. In conclusion, he considered it most desirable that an expedition should be sent out, to explore thoroughly the three lines that had been indicated, that their relative merits might be compared.

Mr. James Walker, C.E., F.R.G.S., said that the height of the water level above the mean level of both oceans, was an important element of consideration, and until this was determined accurately, it would be impossible to enter into the hydrographical question. Again, the proposed diversion of part of the waters of the Atrato into the Truando, would tend to diminish the stream of the Atrato below its confluence with the Truando, its sectional area might be considerably decreased, and the river might be thus unfitted for the navigation of large vessels. A work of this description appeared to him to be impossible without the use of locks, and the construction of the required tunnel would be a very formidable work; but, as the object to be attained was a great and national one, the best thing that could be done would be to have a good survey made. The vast quantity of water in the rainy season had been complained of. A large quantity of rain, he thought, would most of all favour Mr. Kelley's project, as it would serve to maintain the streams of the rivers. Mr. Walker referred to the Caledonian Canal, of which the great repairs and improvements made after its original formation were done under his direction, as in some degree a parallel case to that of the Atrato and Truando, and also to the proposed junction of the Pacific and Atlantic through the Lake of Nicaragua, on which he had, with Colonel Aldrich, R.E., reported to the British Government.

Mr. Kelley, in answer to some questions proposed by Mr. Walker, remarked that an excavation of only 120 feet in height, or 90 feet above high water, would be required for the tunnel, as vessels would strike their topmasts; also, that the mean inclination of the Truando was 3 inches per mile, and not a foot, as had been stated. The sectional area of the Atrato, at the junction of the Truando, was 350 yards broad and 58 feet deep. He proposed to deepen the bed of the Truando 15 feet, and to convert it into a canal to run into the Pacific. In his plans he had calculated that all the water for the canal might be derived from the Atrato, although the valley of the Truando abounds in lagoons and swamps from which much water might be obtained.

Mr. Peacock, F.R.G.S., had met at Buenaventura, Admiral Illingworth, of the Bolivian Navy, who had travelled on the San Juan. He had ascertained that the "Arrastadera" (Raspadura) Canal, said to have been formed by a curate at the end of the last century (who died in the "Inquisition" at Carthagena), really did exist, and that goods had been sent by it from one ocean to the other. This gentleman had also stated that the Napipi could be reached from the Pacific after crossing a small elevation, probably not more than 100 feet, by following the windings of the valleys between the mountains; and that, in the Atrato, there was plenty of water for the largest ships. The bar, at the mouth of the river, might be easily removed, or, what would be still better, a canal might be cut from deep water to deep water, as, if the bar were removed, the mouth would probably soon silt up again. He thought that the importance of the work could not be over-estimated. In his opinion, the climate was the only great obstacle to success: the valley of the Atrato had been called the Valley of Death, so far as Europeans were concerned. Panama is comparatively healthy, yet very many had lost their lives in the construction of the railroad.

Mr. Webster, F.R.S., thought that there had been some misunderstanding with regard to the levelling. The level from Humboldt Bay to the Truando had been ascertained by means of a spirit-level. In answer to Mr. Walker, as to whether this route were intended to exclude the Nicaragua scheme, he would say, *No*; Mr. Kelley had not brought it into contrast with other routes such as those of Panama and Nicaragua. The route Mr. Kelley had proposed was essentially a canal route, and the important question is whether any better route can be devised. The mouth of the Napipi appears to be about 70 miles farther up the Atrato than the mouth of the Truando. Now, it would plainly be desirable, in order to secure the greatest depth of water, not to ascend the river too far. Therefore, at first sight, the proposed route is the most practicable. The tunnel required had been objected to; yet, what was a tunnel of 3 miles, compared with the tunnels on some of our railroads? It is not quite fair to contrast this scheme with railway schemes; but the comparison of work to be done was favourable to Mr. Kelley's route, as that would involve a removal of only 147,000,000 cubic feet of earth, whereas the Panama railroad required the removal of 226,000,000 cubic feet. The Nicaragua route, again, required several locks, and the works on that would be truly gigantic when compared with the route he proposed. He thought that the alarm at the drying up of the Atrato might serve for an objection by the engineer of a rival railway; but when it is known what such engineers as Walker, Telford, and others have done in the fen districts with such simple means, he saw no reason why something equally effective might not be done here.

DR. BLACK said, that though no engineer, he saw plenty of difficulties to be overcome; but the question now was not as to difficulties—it was as to the discovery of a practicable route for a ship-way between the two oceans. He thought that the repeated examinations made under Mr. Kelley's direction, and at his sole expense, reflected the greatest credit upon him. The route thus indicated looked as though it might be carried out. He concurred with the opinion so ably expressed by Captain FitzRoy, as to the world-wide importance of this subject, which no difficulties should prevent us from pursuing. The whole of that part of the barrier between the two oceans, which is now unknown, should be thoroughly investigated by the great maritime nations, that the world might know what were the obstacles to be overcome, and what would be the cost of overcoming them. The question would then be—has the commerce of the world arrived at a point which would justify the necessary outlay of capital to execute the work? The time, if not arrived, is rapidly approaching when this great work must be done in spite of all obstacles and any cost. He fully believed that the benefits to be derived would quite repay any amount of capital that it would be necessary to lay out. If commerce goes on increasing at the rate it has done for the last twenty years, it would be hard to say how much capital might not be laid out so as to yield a prospect of a fair return. Allusion had been made to the unhealthiness of the district: no doubt this was a difficulty; but from strict investigations which had been made, it had been ascertained that the chief mortality in the construction of the Panama railroad was not owing to the climate. The men were of a very mixed class; no care was taken to house or feed them; good water was not provided for them, and they were allowed to buy spirits as they pleased. Like navvies, they were allowed to do what they wished, and when they died, others were put into their places. If the men who may be employed on the isthmus, hereafter, are attended to and protected as they should be, the mortality will doubtless be much less among them. Allusion had also been made to railways on the isthmus. He was sure that Mr. Kelley had no jealousy against railways, but would be the more delighted the more there were that crossed the isthmus, as the increase of commerce thus indicated would require a corresponding increase of ships. Commerce arises from two causes:—first, from the variety of natural or artificial products in different parts of the world; and secondly, from an instinctive love of gain and the desire to supply new wants. When different countries became acquainted with the difference of their products, they were sure to trade with each other, whether separated by mountains, deserts, or oceans. He thought that we were much indebted to Mr. Kelley for his liberality and his boldness in bringing forward his proposal; and he hoped that the commercial nations of the world, the United States, France, and Great Britain, and even Russia, would combine in causing the barrier between the two oceans to be no longer unknown to us.

M. DE LESSEPS: M. le Capitaine FitzRoy, parlant d'un projet de canalisation de l'Isthme de Darien, vous a dit tout à l'heure, dans un langage éloquent, que beaucoup de grandes entreprises, paraissant d'abord chimériques avant d'avoir été étudiées, deviennent réalisables aux yeux de tout le monde, lorsqu'elles ont été sérieusement examinées sur les lieux; j'espère qu'il en sera ainsi pour le Canal Interocéanique dont il vient d'être question, et je fais des vœux pour sa réalisation. Quant au percement de l'Isthme de Suez, sur lequel M. le Président a bien voulu m'inviter à dire quelques mots, je puis vous assurer que l'entreprise est tout à fait praticable. J'ai réuni, il y a peu de mois, une commission composée des plus célèbres ingénieurs de l'Europe dans les travaux des *ports ou de canalisation*, et dont font partie MM. Rendel et

M'Lean, bien connus de vous tous; M. de Negrelli, inspecteur général des travaux publics de l'Autriche; M. Paleocapa, ministre des travaux publics de Sardaigne; M. Conrad, ingénieur en chef des Pays Bas; M. Lentze, directeur des travaux hydrauliques de la Prusse; M. Renaud, inspecteur général des ponts et chaussées de France; M. Lieussou, ingénieur hydrographe de la marine Française; et M. Montesinos, directeur général des travaux publics de l'Espagne. La majorité de cette commission s'est rendue en Egypte; elle a déclaré à l'unanimité que la canalisation de l'Isthme de Suez et l'établissement de deux ports sur la Mer Rouge et sur la Méditerranée étaient des œuvres faciles et d'un succès assuré, dont la dépense totale n'excédera pas deux cents millions de francs.

La rade de Suez est vaste et sûre. Cinq cents bâtiments et plus pourraient y trouver place. Les profondeurs sont de 5 à 13 mètres sur un fonds de vase d'une excellente tenue. La corvette Anglaise *Zenobia* y sert depuis trois ans de magasin de charbon pour le service des paquebots des Indes. Elle est dans la région la plus exposée aux vents, et dans le cours de ces trois années ses ancres n'ont pas varié, ses cables n'ont pas éprouvé la moindre avarie, ses communications avec la terre n'ont pas été un seul jour interrompues, ce qui n'arrive pas constamment dans des ports qui passent pour excellents. Deux passes profondes et saines, assez larges pour qu'on puisse y louvoyer en tout temps à l'entrée et à la sortie, et s'ouvrant par des profondeurs de 16 à 20 mètres, donnent accès au mouillage.

La commission a pu conclure de ces données, que la rade de Suez avait toutes les qualités désirables pour former la tête du canal des deux mers, dont les jetées ne devront pas avoir plus de 1600 mètres pour atteindre les profondeurs de 8 à 9 mètres suffisantes pour les plus gros navires.

Sur tout le parcours de l'Isthme, dont la largeur est de 30 lieues de Suez à Peluse, la commission internationale n'a rencontré aucune difficulté pour le creusement du canal, ni pour sa conservation dans un sol uni, et dont la composition géologique est très favorable. Les sondages vérifiés par elle établissent que le sol de l'Isthme est, en général, formé d'une première couche de sable agglutiné, d'une seconde couche de terre argileuse, d'une troisième couche de marne calcaire jusqu'à ce que l'on arrive à l'argile plastique, vers 11 ou 12 mètres au dessous du niveau des mers.

Pendant notre excursion dans l'Isthme, le Vice-Roi avait envoyé la frégate à vapeur, le *Nil* dans le golfe de Péluse, où M. Larousse, ingénieur hydrographe, muni des instructions de la commission, avait pu exécuter de nombreux sondages dans des conditions très favorables, et lever le plan hydrographique de la baie. Il fut constaté, qu'en avant du cordon littoral, s'étendait une zône de sable fin pareil à celui de la plage, qui finit aux profondeurs de 10 mètres, à partir desquelles commence une zône de vase d'une bonne tenue pour l'ancrage des bâtiments, et se prolongeant jusqu'aux grands fonds de la Méditerranée. La partie de la baie où les grandes profondeurs se rapprochent de la côte est à la hauteur de 6 aunes. L'on y trouve 8 mètres d'eau à 2300 mètres de la plage sur une étendue de cinq lieues entre les bouches d'Oum Fareg et celle de Gamileh. C'est là que la commission a fixé l'entrée du canal par la Méditerranée. Des jetées de 2300 mètres n'ont rien d'extraordinaire; et dans l'endroit où elles seront placées, l'abordage et l'appareillage présenteront toute facilité à la navigation.

Je m'occupe dans ce moment de la publication d'une brochure qui contiendra les procès verbaux des études de la commission internationale pendant son exploration de l'Isthme de Suez, ainsi qu'une réponse à la Revue d'Edimbourg, qui a propagé des idées erronées sur la praticabilité de l'entreprise. Les erreurs dans lesquelles est tombée la Revue sont excusables, parce qu'à l'époque où elle a traité la question, elle ne pouvait pas encore connaître les travaux de la Commission des Ingénieurs.

J'aurai l'honneur de faire hommage à la Société de Géographie de ma publication : elle fera suite à celle qui a paru à Londres l'année dernière, et que la Société a bien voulu accueillir favorablement.

The Meeting adjourned to the 12th of May.

Tenth Meeting, *May* 12, 1856.

REAR-ADMIRAL F. W. BEECHEY, PRESIDENT, in the Chair.

Lieut. M. F. Maury, of the United States' Navy, and Commodore C. Irminger, of the Royal Danish Navy, were elected Corresponding Members; and Charles Churchill, Esq.; Robert Ferguson, Esq., M.D.; *James Hewitt, Esq.; and Rear-Admiral G. F. Rich, were elected Fellows.*

The discussion on Mr. Kelley's paper on the Atrato Inter-Oceanic Canal, which had been adjourned at the preceding Meeting, was re-opened by the reading of the following letter by the Secretary :—

Letter of BARON VON HUMBOLDT *to* Mr. FREDERICK M. KELLEY.

(*Translation.*)

Berlin, 27th January, 1856.

IT is with the most lively satisfaction that I have taken notice, during your too short visit to Berlin, of the great and solid operations which you have caused to be executed since the beginning of January, 1855, by Mr. William Kennish, a skilful engineer, in surveying and levelling the course of the great river Atrato and its affluents from the W. My learned friend Mr. Alexander Bache, superintendent of the coast survey of the United States, had already drawn my attention to the previous investigations which you had caused to be made; and these researches are the more deserving of regard in consequence of your proposal to extend the investigation, with equal precision, to the passage between Port Cupica and the river Napipi, as well as to other points situated above the confluence of the Truando—positions of great importance in the solution of the vast problem of an oceanic canal.

The great number of maps and sections on large scales, which you possess, furnish all the necessary elements for judging of the possibility of communication through the mouths of the Atrato, the Truando, and a canal leading from the latter to the South Sea. It is owing to such a complete examination not having been effected of the mountainous country between the Gulf of San Miguel and Caledonia Bay, that *Mr. Lionel Gisborne's project* in 1852 has not been executed. Ignorance of the locality, with the want of hypsometrical measurements, led to the sad results of Lieut. Strain's courageous expedition.

The great object to be accomplished is, in my opinion, a canal uniting the two oceans *without locks or tunnels*. When the plans and sections can be submitted to the public, a free and open discussion will elicit the advantages and disadvantages of each locality; and the execution of this important work, which interests the civilised nations of the two continents, should be entrusted to engineers who have successfully constructed similar works. The Junction Company will find supporters among those governments and citizens, who, yielding to noble feelings, will take pride in the idea of having contributed to a work worthy of the progress of intellect in the 19th century. This opinion I have expressed with warmth for more than fifty years. I have laboured, without ceasing, to disseminate the geographical views which tend to prove the possibility of commercial communications, whether by canals, with or without locks, either simple or coupled with inclines; or by means of railroads, uniting coasts or rivers having an opposite course.

Through General Bolivar, I obtained the exact geodetic levelling of the Isthmus of Panama. I was the first to make known, in my Mexican Atlas, the course of the two rivers Huasacoalco and Chimalapa, according to documents found in the archives of the viceroyalty of Mexico. I indicated the proximity of the almost unknown port of Cupica to the sources of the Napipi and the waters of the Atrato, as well as the existence, ignored in Europe, of a canal of very small dimensions, constructed in 1788, under the directions of a monk, curate of Novita, by the Indians of his parish, for connecting the waters of the Raspadura, an affluent of the Quito, with the waters of the San Juan de Chirambira. I think there is nothing more likely to obstruct the extension of commerce and the freedom of international relations, than to create a distaste for any further investigation, by declaring, in an absolute and imperative manner, that all hope of an oceanic canal ought now to be abandoned.

I have described already in my 'Essai Politique de la Nouvelle Espagne'* the immense operation of cutting through mountains the open canal, called the Desague of Huehuetoca, which was executed by the Spanish government at the commencement of the 17th century; and I have now too much faith in the power of the resources offered by modern civilisation, to be discouraged.

I am indebted to Colonel Codazzi, and to the affectionate kindness of the Minister of the Interior at Bogota, M. Pastor Ospina, for important communications which remind me that the route from Cupica to the river Napipi presents successive elevations; and it would be an additional service to geography, if you would cause this route to be levelled.

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* *See the last* edition, vol. i., pages 202-248, and vol. ii., pages 95-145.

The PRESIDENT then rose and observed that, as a previous evening had been given to the general question, and the strictly engineering question as to cuttings had been discussed already, and as there seemed to be no engineering difficulties that could not be overcome, he proposed to confine the discussion of this evening to the remaining portion of the subject, that of the water-level, or what might be properly called the *hydraulic* part of the inquiry; for if this should be found to be impracticable, the engineering portion would necessarily fail also; and as there might be some gentlemen present who had not heard the reading of the paper, he would mention a few of the leading points as they had been stated for their guidance. The proposition before the Society was to unite the Atlantic with the Pacific Ocean by means of a channel without any lock, by which ships of great burthen could freely pass from one ocean to the other; and it was proposed to effect this by means of the Atrato, using the lower part of that river as far as the junction of the Truando, a tributary river, and thence either to make use of the bed of the Truando as far as possible, or turn its stream into the Pacific by means of a canal. It had been ascertained that the mean water-level of the two oceans was the same, and it was assumed from the observations which had been made, that the point of the junction of the Atrato with the Truando was 15 feet above that level, and that the distance of this point on the one side was about 61½ miles, and on the other about 63 miles. With these facts the question of interest was, whether under the proposed circumstances the water could be maintained in these two arms at such a level, considering the supply and the drainage, as would render the communication available at all times; and what would be the effect of the tide of the Pacific in passing up such a channel, whether it would facilitate or render more difficult the object in view? These were questions of the highest moment and of greatest interest; and seeing that the Meeting was favoured with the presence of several of the most eminent engineers of this country, he would leave the question in their hands, and ask Mr. Robert Stephenson to favour the Meeting with his opinions first: the point being not so much to consider the details of the question, as to determine whether the facts were sufficiently promising for the recommendation of a more accurate survey being undertaken.

MR. ROBERT STEPHENSON, F.R.G.S., said that the President seemed to fear a difficulty in reference to the tidal action at the junction of the Truando and Atrato. Considering the oscillation of the Pacific to equal that in the Severn, still it would present no difficulty to him. The distance is about 130 miles from sea to sea: no river in England was exposed for nearly so great a distance to tidal action; even the case of the Severn was exceptional. The engineering difficulties did not seem to him to be serious; but, as he was excluded from that side of the question by the decision of the President, he would simply add, that the great difficulty appeared to him to be in making a good entrance into the Atrato. At the entrance of that river vast quantities of mud had been deposited, and a delta of great extent formed, enclosing a series of lagoons, through which no permanent channel is maintained; and this is the case of all rivers that fall into a tideless sea. The success of the scheme would therefore depend on forming a good entrance to the river; for this, artificial communication would be necessary. He had no means of judging its feasibility, but would assume that it was feasible on Mr. Lane's statement. He concluded by expressing his high sense of the enterprise and liberality of Mr. Kelley.

In answer to a question from the PRESIDENT, MR. STEPHENSON explained that a fall of 3 inches in a mile, which was that estimated in the present case, was not unusual in artificial canals; and that the supply of water would be amply sufficient to maintain the canal at a proper elevation.

Sir Roderick Murchison, f.r.g.s., begged to observe that the discussion of this question had naturally assumed very much of an engineering character, and acknowledged that the Society was much indebted to the eminent engineers who had already spoken this evening and on a former occasion. He suggested, however, that no true inductions could be arrived at, nor any sound attempt made to realize the grand idea of Humboldt, until a *general and accurate geodesical survey of the whole region* alluded to had been completed. In this praiseworthy cause Mr. Kelley had done more than any other person, and he now asks this Society to exercise its influence with the British Government to assist, with other powers, in carrying out this great and essential preliminary survey, in the absence of which he did not pretend to say that the line he had suggested was the best which could be chosen.

Mr. G. Rennie, f.r.g.s., said that this was (to use the words of the President) emphatically a water question; for in the valley through which a canal would have to pass, rain fell almost incessantly for nine months in the year, and such rain was rarely seen in any other part of the world. It was therefore one of the most important elements, or rather aliments, of the question. With regard to the effect of admitting water into the canal either from the Pacific Ocean or from the Atrato, he had no apprehensions; for the length of the canal between its junction with the Pacific at Paracuchici and with the Atrato was so great, and the oscillation of the tide at either end so small (notwithstanding they were high and low at different periods), that before the water of a spring tide in the Pacific could have any effect on the water in the canal, the velocity of the water would be so retarded by the friction and resistance of the sides and bottom of the canal, as to reduce the inclination of the surface of the water (in the canal) to *three inches* per mile over the whole distance of the Truando part; but before the water of the Pacific reached the farther extremity, the tide would have fallen, and thus the two opposing forces of the pressure of the water without, and the canal within, would be reduced to an equilibrium. At 3 inches per mile, the motion of the water is scarcely perceptible. As regards the effect of the passage of the water-flow of the Atrato, no fear need be entertained; the area of the section of the Atrato at the junction, being from nine to ten times greater than that of the canal of the Truando, will afford an abundant supply of water to the canal. The Atrato is as wide as the river Thames at Waterloo Bridge, and 47 feet deep, so that there is ample width and depth for the largest merchant vessels, and even vessels of war. The objections to navigating it were considerable, as its channel was difficult to define, when passing through the many lagoons or lakes which overflowed its banks in many places, particularly at its junction with the Truando, which is described by Mr. Kelley to be usually covered by a vast lagoon or lake at the entrance, and thus very difficult to find; so that the course of the river or canal will have to be buoyed and staked, and pilots would be necessary. With regard to the other parts of the canal there were difficulties of no ordinary kind. The Truando was one of them. The entrance into the Gulf of Darien was exposed to the N. and N.E. winds, but their effect did not seem to influence the mouths of the Delta, behind which there was shelter. It had been proposed to convert the Coquito branch into the main entrance into the Atrato, by blocking up the branches and turning all their channels into the Coquito. There were other difficulties at the entrance into the canal from the Pacific, as at Paracuchici, where the surf beat strongly on the shore, although the water was calm inside. It would be a question between an entrance with an open mouth on that part of the shore, or into Humboldt Bay. *It would also be* reasonable to put down half a million as the cost of each *harbour, in addition* to the cost of the canal, estimated at thirty millions, say thirty-one millions. The sum was great, but the object was still greater; and considering that the distance round the vast peninsula of South America was estimated at *nineteen thousand miles* from New York to San Francisco, and that by the canal it would be reduced to 5700 miles—considering also that the passage round Cape Horn was seldom less than *one hundred and fifty days*, and often above two hundred and fifty days; that the passage by the canal would be made in one hundred and five days; that the cost of maintaining the ship and crew of a fast vessel, including insurance and all charges, would be 10,475 dollars, not including the extreme contingencies of shipwrecks and loss of human life, Mr. Rennie was of opinion that the vast advantages which would accrue to the world at large were well worth the sacrifice.

Mr. Beardmore, F.R.G.S., remarked that there were one or two facts and first principles of science which might be laid down as axioms.

The first was the relative level of the two oceans: he believed it to be a consequence of the law of gravitation that the mean level of the ocean was substantially the same at all parts of the globe, and would be so as long as a pound of sea water everywhere occupied the same space, and was composed of the same constituents. He had investigated every kind of available observation on the level of the ocean, including the Ordnance Survey of Great Britain, and the testing levels taken at the instance of the British Association between the English and Bristol Channels, and connected with the admirable surveys of the President (Admiral Beechey), and had in his own professional experience made numerous minute surveys, all of which confirmed this view. Where surveys showed different results, it was because the mean tide level had not been ascertained with sufficient accuracy.

He had also investigated the facts presented by Mr. Kelley, which appeared to him to prove incontestably that the junction of the Atrato and Truando could not vary materially from the stated height of fifteen feet above the mean sea level. With these facts, combined with the rise of twelve feet tide in the Pacific, the questions before the Meeting were—

Firstly. Whether a free communication between the waters of the Pacific and the Atrato, at the point in question, would be practicable for navigation?

Secondly. Whether such a communication would be likely to reduce the level of the Atrato to a serious or injurious extent? and

Thirdly. Would it cause any tidal action of a prejudicial nature on that river?

1. The first question might be answered in the affirmative without any hesitation; for the extreme fall could not possibly create a current greater than from two to three miles per hour, where beyond the tidal action; within it there would be the usual flow and ebb, to be found in a somewhat sluggish tidal river which has no great interior basin to fill or empty.

2. The second question might be dealt with in a familiar way, by assuming, for instance, that the Atrato had at present as much as four inches fall in any or every mile of its course. Now the river was evidently one of very large volume, and liable, from the character of the mountains draining into it, and from the excessive rainfall of the climate, to heavy floods; its width was therefore great, and its depth varied from 45 to 85 feet. Assuming, then, that it were possible to abstract sufficient water to reduce the surface fall to a minimum of one inch per mile (a flatness rarely to be found), the depth at the junction would only be reduced about *ten* feet, and the power of discharging its waters would be reduced 50 per cent.; or, in other words, one-half of its entire volume would be available to fall through the new cut towards the Pacific. But it must be remembered that, as the height of the Atrato at the point of junction was reduced, so would the velocity down the new cut be decreased, and therefore it would not in reality carry off any such proportion of the volume. *These statements* are matters of well-known fact in the science

of hydraulics, being consequences of the law that, *cæteris paribus*, the velocity and the discharge of any river vary as the square root of the rate of fall.

3. The third question admitted of a favourable answer. There were many familiar instances in this country where the tide had been admitted by new works into large areas, with great advantages to navigation, and without injury to other interests. No better example existed than that of Peterborough and Wisbech, at which latter place the tidal flow had been increased from 8 to 18 feet by the works of the Messrs. Rennie, and without affecting the flow at Peterborough, some 18 miles higher up the same river; and works were now being carried out there, which might probably increase the flow at Peterborough (now about 6 inches at spring tides) to 3 feet, with every advantage to navigation.

A familiar and grand example of Mr. Kelley's scheme occurs in the Hooghly or Calcutta river, which branches from the main body of the Ganges at about 170 miles above that city, and carries down large floods with a slope somewhat analogous to that proposed by Mr. Kelley, while the tide is felt for about half of its entire length from the Bay of Bengal, under circumstances well known to be highly favourable to the development of the tidal wave, and somewhat similar to the case of the Severn.

There were, however, most important engineering questions touching the especial manner of leading away the new line of navigation from the natural river, which could only be decided by the most careful surveys, and would depend on the amount and rise of flood waters; and the nature of the soil and valley at the position considered as being best adapted to meet the various contingencies of so important an engineering and geographical problem as the formation of an interoceanic ship canal.

It was a subject of infinite interest and value, and the very want of data, on which to speak more precisely, was the strongest argument for its claiming the attention of the Governments to its investigation by thoroughly experienced engineers and surveyors.

He thought it highly probable that at the junction of the Truando corrective engineering works would be necessary to control the flow from the Atrato, and to prevent the new cut being made a channel for flood waters; and how to do this effectually and economically was the great problem; all others were mere questions of money, and prudent adaptation of the works to the nature of the difficulties to be surmounted.

SIR RODERICK MURCHISON repeated, that Mr. Kelley's object in coming before geographers was to obtain their aid in bringing about a grand survey of the physical features and altitudes of the whole region in question, through the co-operation of the Governments of England, France, and the United States, an object which he thought must meet with the support of every geographer.

The Secretary then read a paper by Captain Lort Stokes, R.N., F.R.G.S., on Steam-Packet Routes between England, Australia, and the Cape of Good Hope. An animated discussion followed the reading of this paper, which was adjourned to the next Meeting. An account of the paper and of the discussion upon it will appear in the ensuing number of the Proceedings.

ADDITIONAL NOTICES.

1. *Journey from Benguela to Mozambique.* Translated from the Portuguese '*Boletim e Annaes do Conselho Ultramarino.*'

On the 12th of November, 1854, some Moorish traders arrived at the capital of the Portuguese province of Mozambique, on the S.E. coast of Africa, bearing a despatch from the Governor of Angola, on the West Coast. They left Benguela on the 9th of June, 1853, and were accompanied by Antonio Francisco da Silva Porta as far as Cutonge, where they arrived in 107 days. It is to be lamented that no instructed person had joined the party, for very little information could be obtained from them. They found large towns and dwellings in every part; they had to pass four large rivers on rafts; they came to inhabited places where ivory was of very little value, and this was more or less the case throughout the journey, principally at Chamopa, on the right bank of the Chamoriro, a great river without fords. Provisions abounded everywhere, and the inhabitants were docile, and rich in good cattle. The following itinerary gives all the information which could be obtained from the travellers.

On the 9th of June, 1853, they left Benguela, and proceeding in a southerly direction, arrived at Cutonge, which they left on September 22, 1853. They passed the river Nambuate, travelling along the side of a thick forest on its left bank, through a fertile country. At Evianda they spent three days, and passing through the small town of Nameliô, they reached the deep river Namecaque, 100 fathoms (braças) wide, running from north to south through cultivated plains. The following small places, with few inhabitants, were reached in succession, viz., Inane, Metondo, Chontongo, Molonde, Nuhete-Cassilura, and Luana; and then the fordable river Tuanhete, and the small places called Poinge, Mussangue, Cambira, Hate, and Macomba, the last having only a few people. The Moors then penetrated through a forest called Mulugane, where they suffered from a scarcity of water; and at Ohcoingo they found the great river Chamoriro, running southward, with the large town of Chamopa on its right bank, abounding with provisions, the country being cultivated. The track proceeds to the town of Haycolom, and across the small rivers Pacapiço and Mecomalache to the small towns of Tagumbe and Pasmube, and the forest of Xambia. Several towns were now passed in the following order:—Cartacorbo, Ococalhe, Hohambe, Coguem, Ponhina, Laquié, Muiasse, Viciú, Pacacello, Capane, Rumbue, Guiner, the large town of Coimba, with cultivated lands and no lack of food, Cocussilmba, Oramba, Rupachasse, and Pansuanrba, the last-named town having sufficient cultivated land, but its inhabitants are great thieves. After crossing the fordable river Corimba and Sund, they came to a town of the Muizas, called Paringa, where they could find nothing to eat; but several places were afterwards passed, all of which were inhabited and cultivated by the Muizas, and contained many people, who were generally hospitable and good. The names of these places are Semdá, Pacalem, Chuma, Musambe, Quelebia, Rusanga, Mataracuens, Mussana, Timbore, and Pararo. The great river Ruanga appears to be the boundary of the Muizas territory. The next towns, Runga and Cambille, were followed by the forest of Muito, the town of Quicusse, with many people, and the forest of Tumbuca. Three towns were now successively reached, named Utura, Patuama, and Tagume, having many people and much cattle; then the small town of Uamache, and other small towns with few inhabitants, named Tabiá, Tambuca, Muache, Cocassura, Moache, and

Caiora. Utumbuca Pambraculima has a commodious town, and provisions in abundance. Utumbuca Modone has no town, but there is a river, and the party were detained here a day. They now reached the Nhaça (Niassa) country, and passed the following towns with few people and much provisions, named Nhaça Buha, N. Pamucamba, N. Paherere, N. Pamira, N. Pachicoca, N. Pacamonga, N. Paquasi, N. Pachamonga, N. Pomoro, N. Mamutamlarasa, N. Pamunabombi, N. Papache, N. Pamacouba, N. Pacafurmira, N. Passifuri, and N. Chamuconde. The town of N. Paquasi, before mentioned, is large, with many people and much provisions. The Moors were attacked here for nine days; they killed sixty-five persons and wounded eight, and three of their own party were killed. On leaving the Nhaça, the Jana country was entered, and the following towns were passed, containing many people, viz., Jana Pacamussicusa, J. Passimoro, J. Pamudicula, J. Pajimucudo, J. Paruere, J. Pamuganbo. These were succeeded by the populous town of Uvuma; the town of Maconde, with much forest; Miquindane, a Moorish town containing a large mosque, and the towns of Mucimbua and Ibo, with many inhabitants of good character. The last-named town, Ibo or Wuibu, is on the Mozambique coast, and terminates the itinerary. Neither bearings nor distances are mentioned, and the time occupied is only spoken of once, during the whole journey, namely, on reaching Cutonge. Among the names that can be identified are those near the Mozambique coast, also the Jana, the Nhaça, the Tumbuca, the Muizas, and the river Ruanga; the rest are almost entirely unknown.

2. *Table of Pluviometer, kept at George Town, British Guiana.*

MONTHS.	1829.	1830.	1831.	1832.	1833.
	Inches, 100ths.	Inches, 100ths.	Inches, 100ths.	Inches, 100ths.	Inches, 100ths.
January	..	9·27	13·84	17·96	3·41
February ..	..	6·08	10·12	3·64	2·74
March	..	10·10	15·82	11·49	3·69
April	4·90	10·78	19·48	4·76	7·67
May	13·71	11·02	12·09	8·57	4·49
June	10·48	10·65	13·42	9·98	7·87
July	16·22	7·27	16·48	3·32	8·33
August	1·88	7·43	18·56	2·78	4·47
September ..	5·49	1·15	2·16	0·91	0·41
October	0·74	1·00	1·16	0·15	..
November ..	1·85	1·91	7·17	2·44	..
December ..	12·05	12·98	6·39	8·60	..
	68·21	89·74	136·60	74·60	

(Signed) R. OWEN.

3. *Analysis of List of Pitcairn Islanders landed in Tahiti 23rd March*, 1831.

(From a Letter of Capt. SANDILANDS.)*

Males, 46; females, 39:—Total, 85.

The eldest man was Thursday October Christian, aged 44.

The eldest woman, Mary Christian, aged 37.

The average age of males was	13½
Ditto females	10½
The number of males under 12 was	26
Ditto females do.	20
Number of males over 20	11
Ditto females do.	10

Of one woman, Susannah Christian, a native of the Sandwich Islands, the age was not known; and one child, Lucy Ann Quintall, was born at sea, on the passage from Pitcairn Island to Tahiti.

The names and number of persons in the families removed were—

Name.	Male.	Female.	Total.
Christian	10	11	21
Adams	3	..	3
M'Coy	7	3	10
Quintall	10	8	18
Young	7	6	13
Buffett	4	..	4
Nobbs	2	..	2
Evans	3	..	3
Uncertain	..	11	11
	46	39	85

The large proportion of children, and the immature age of the majority both of males and females, as indicated by the above analysis, sufficiently accounts for the mortality from which they suffered during their residence at Tahiti.

An interesting fact relative to the return of these people to their original habitation is mentioned by Captain Fremantle, in the enclosure of Captain Sandilands' communication, viz., that the cost was defrayed by the sale of the copper bolts of 'The Bounty.'

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* *See* also vol. iii. of the Journal R. G. S.—ED.

4. *Extracts from a paper on the Isthmus of Darien.*

By Dr. CULLEN.

NEAR Cana, on the river of the same name, which is an affluent of the Tayra, or Santa Maria, from the west, was situated the famous gold mine known as "Mina Reale," in the Cerro del Espíritu Santo, the richest that ever was worked. I read (he says) by permission of the governor, Don José de Obaldia, in the archives of the Treasury of Panama, the account for a number of years of the sums transmitted to Spain for the King's vientaro, or twentieth, from this mine (the Royal quinto, or fifth, having been reduced at an early period to 5 per cent.). They averaged upwards of 3,500,000 dollars per annum, which would give upwards of 70,000,000 dollars per annum for the whole produce; a prodigious return, considering that there never could have been many more than 300 or 400 negro slaves mining. The town, Santa Cruz de Cana, had two bakeries, a strong garrison, nine villages or missions, and many farms and hunting establishments in its vicinity; a vestige of it does not now remain. My guide, and one of the four Indians whom I employed to clear a path, were born in it, but left it with the last remnant of its inhabitants, more than twenty years ago (1850). In the course of my journey I got out of various spots, where I picked and dug, upwards of 3 lbs. of gold, 22 carats fine; and I found the soil on the banks of all the streams where I dug to be much richer than any I had met with on the branches of the San Joaquin or the river Mariposa in California, and I found several pieces of rock with veins of gold.

The Mina Reale was closed while in a high state of productiveness by order of the King of Spain, in 1685, on account of the incursions of the Buccaneers. Besides the Cerro del Espíritu Santo, several mountains in the vicinity are very rich in gold, as the San Juan, San José, Tumbasabe, Setegante, &c. &c. About the sources of the river La Marca, which is an affluent of the Tayra, about 15 miles from its mouth, and especially at Tayecua, the finest gold is procured; and on the Rio Balsas, which flows into the same river, about 3 miles above the La Marca, gold is found abundantly near the villages Camoganti and Tucuti. I found auriferous soil in many places, as at San Bartolomé, Juan Dias, Mariprieta, Pan de Azucar, &c.; gold is likewise got at Penonome, and there are very productive mines at Santiago, and Concepcion in Veragua: near Santiago, on the estate of Señor Romero, ex-governor of Veragua, the average return last December was ½ lb. of gold for 25 lbs. of auriferous dust. During the years 1800-1804, there were introduced from the provincial treasury, from the river Concepcion and its tributaries, 2067 lbs. of gold to pay the 3 per cent. due on the produce of these washings. But none of these can compare with those of the Isthmus of Darien. The wealth which the old Spaniards derived from this isthmus, and the consequent importance they attached to it, may be estimated by the number of forts which they maintained in various parts. About Boca Chica only there are the ruins of four—the Fuerte del Principe, commanding the old road from the Pacific to the Atlantic, is situated near the head of the Tayra, about 25 miles from the gulf of San Miguel; and at Yavisa, on the river of the same name, also called the Chico, a tributary of the Chuquanaqua, is a fort large enough to require a garrison of 200 men.

The earliest settlement in South America was at Santa Maria del Darien, near the mouth of the Atrato, and from this Vasco Nuñez de Balboa crossed the Isthmus, and on the 26th of September, 1513, discovered the Pacific in the gulf of San Miguel, most probably at Morro Paterio, near Plaza Guadara and the river Moguey, both perhaps named by him.

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PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1856.

Eleventh Meeting, May 12, 1856—*continued.*

2. *On Steam Communication between England, Australia, and the Cape of Good Hope.* By Captain J. Lort Stokes, R.N., F.R.G.S.

The question of a steam packet line to Australia has been thoroughly discussed, in all its bearings, for more than ten years, and it has at length become necessary to select some one particular route without further delay. Captain Stokes urges afresh the claims of a line to Singapore, through Torres Strait. He remarks on the populous Archipelago it would traverse, its relation to the French settlement of New Caledonia, and the outlet that it would afford to the Australian squatters, who are stretching onwards to the Gulf of Carpentaria—a region which he believes to be congenial both to Europeans and to their cattle, and to offer an advantageous site for a penal settlement. He considers the dangers of Torres Strait to have been much overrated; the passage recommended has no sharp turns, and can be navigated in the night time, except for about 100 miles. If a second steam packet route could be supported, he would recommend one from Aden to Mauritius, and thence across to Australia; it might be connected with a branch line along the east coast of Africa to the Cape of Good Hope, by way of Mauritius.

The route across the Indian Ocean, by Diego Garcia, is a little shorter than that by Torres Strait, but it crosses a hurricane track, stormy seas, and a wide extent of profitless ocean.

Sailing Directions, &c.—As rather an exaggerated notion of the dangers of Torres Strait appears to be entertained, the following details of the passage which I recommend may be acceptable:—

Ships coming from the westward should arrange to make Booby Island before daylight, and, through the tranquil seas of the Asiatic Archipelago, steamers may reckon on doing so with some certainty. To facilitate the approach to Booby Island by night, it is proposed to erect a light there; although, from its elevation, isolated position, and bold character, there is no difficulty in making it at any time. Hence the track proceeds through Prince of Wales Channel, the entrance to which is a mile in width, having a sunk reef on its northern side, which it is proposed to mark plainly by two buoys. In every other part of the track the passage is much wider, varying from 3 miles in only a very few places, to 10 and 20 miles generally, and free from hidden dangers, except in the single case of the western *entrance.*

On clearing Prince of Wales Channel, the course lies north-easterly between Travers Island and Double Island (7 miles apart), in the direction of Mount Ernest, which is above 750 feet high. Thence it takes a more easterly course, passing midway between Saddle Island and Ninepin Rock, where the channel narrows to 3½ miles at a distance of 40 miles from the western entrance. The track continues nearly in the same direction, passing close to the north side of Bet Island, and midway between Dove Island, Cocoa-Nut Island, and Village Island; then it passes west of Arden Island and Rennell Island, between Dalrymple and Campbell. Six miles N.E. of the last named lies Stevens Island, at a distance of about 100 miles from Prince of Wales Channel. From abreast of this island daylight is no longer necessary, the passage lying through Bligh's entrance, between Bramble Cay and the tidal reef south of it, leaving a width of 13 miles and a depth of 22 to 26 fathoms. It is proposed, if thought desirable, to mark this entrance by a light on Bramble Cay, and a buoy near the tidal reef. The track continues eastward, passing outside Portlock Reef and the Eastern Fields, when the sea is open in the direction of Sydney. The islets which dot this part of the Strait, are so bold, that they, of themselves, quite beacon the passage. Sail may be carried through the greater part of it in either monsoon. In making the eastern entrance of Torres Strait, the lofty mountains of New Guinea may be seen forming a safe landfall; and the greatest comfort to the navigator is the singular shelving nature of the bottom fronting Bligh's entrance. Throughout the Strait the direction of the track ranges only between E. and N.E., or W. and S.W., without any sharp turn. The streams of tide set fair along it, with a moderate and even depth of water throughout, and the navigation is the easiest that it is possible to imagine through a coral sea. For 100 miles only is daylight at all necessary.

As it will be requisite to have a coal depôt in Torres Strait, the party in charge might superintend the lights, buoys, and also the pilotage that may become desirable. The coal may be conveyed from the mines near Sydney to this depôt, with a degree of ease and economy that can never be attained on the southern route; this is owing to the number of ships which proceed from Sydney in ballast, through Torres Strait to India.

SIR R. MURCHISON, F.R.G.S., having briefly alluded to the first portion of the able memoir of Captain Stokes on the capability of navigating through Torres Strait by steam packets, begged to say that he (Sir R. M.) took the deepest interest in the other object of the author, viz., the establishment of a colony at the head of the Gulf of Carpentaria. He had formerly pressed the consideration of this measure upon the attention of H. M. Colonial Secretary, the Duke of Newcastle. He felt certain that the settlers in New South Wales (who had already stretched far to the north of Moreton Bay) would, ere many years, reach the Gulf of Carpentaria; and if, in the mean time, a settlement and port were formed there by convict labour, we should thence have a safe and certain route to the Indian Seas, avoiding the risks of Torres Strait, and rendering a number of worthless men useful in connecting the interests of our distant colonies.

MR. CRAWFURD, F.R.G.S., could not see any objection to the route proposed by Captain Stokes, and thought it the best that could be adopted. The interest of Australia was as completely identified with India and the Indian Archipelago as with England itself, independent of the great population of British India and of China and the countries between. There was within the Strait of Malacca and close to Australia a population of 250,000 persons. The imports and exports of these alone already amounted to 10,000,000*l.* sterling. Java had 10,000,000 of inhabitants, and trade might be indefinitely extended in this direction. The route by Torres Strait is that desired not only by the majority of the Australian colonies, but by all parties in India. It may or may not be, by a few days, longer than some others, but it is unquestionably that which will pay best, be most cheaply kept up, and confer the most immediate and largest benefit.

He had, however, serious objections to make to some statements in *Captain Stokes'* paper. He thought the French would have great difficulty in dealing with the inhabitants of New Caledonia, who were a stout, savage, negro race, and rather warlike, inhabiting a tropical region little adapted to the European constitution, and he could not suppose the Gulf of Carpentaria had a climate suitable to European constitutions, nor could he see anything to induce English settlers to select that locality. It was within 18° of the Equator; and in his opinion, had neither climate, soil, nor water to recommend it. Wheat could certainly not be grown upon it, and it was totally unfit for sheep.

CAPTAIN HOSEASON, R.N., cordially concurred in Capt. Stokes' opinions on the navigation of Torres Strait. He had steamed through the strait himself, and had no doubt of its being the best route from Sydney to Singapore. But for postal communication he preferred the Panama line.

CAPTAIN FITZROY, R.N., F.R.G.S., hoped that the discussion would be confined to the question of the most suitable postal route to Australia. This was a matter for the *present* time, but no one could expect to see a canal cut through the Isthmus of Darien in less than 10 years.

He thought that the sketch map which had been used to illustrate the paper, should have shown the direct route from the Red Sea and Cape Leeuwin by the Chagos Islands, as well as the two other lines. This direct track had been objected to on account of hurricanes, but ships were not now deterred from crossing those seas on that account. To steam ships of 2000 or 3000 tons, occasional hurricanes were a mere bugbear. Many years ago we used to hear often of ships being lost in hurricanes, but the improvement in building and fitting ships, and our knowledge of the rotatory motion of these storms, had divested them of much of their danger. This direct route lies across an open sea, through which ships may run, if they please, 20 miles an hour by night as well as by day, and the winds by no means so strong as in the Atlantic. The chief difficulty in making sailing passages from Cape Leeuwin to the Mauritius, is found in the light winds, and returning in the opposing S.E. trades, which, however, he thought, might be considerably lessened by a slight alteration in the course taken.

The route through Torres Strait might be smooth and pleasant in summer, but could Captain Stokes say what it is in winter? Captain Lihou had told him, five and twenty years ago, that he had tried to work his ship through, against the westerly monsoon, that he had got her aground frequently, and that nothing should tempt him to try that passage again in winter. This had made a great impression on him at the time, and since then evidence on the navigation of Torres Strait in winter had been unattainable. It is almost, if not altogether wanting. All our information related to the summer season, and even then vessels would be obliged to anchor during the night, for several nights in succession. This route was not, in his opinion, fit for large steamers, and the passages would necessarily be slow on account of many stoppages and delays. Long runs are required for speed. In an economical point of view it would not do to stop often.

But in his opinion two or three lines would be required—one round the Cape of Good Hope, as well as that through the Red Sea; and both these would open important branch lines, but these branches must not be considered when rapid passages are desired from end to end. There would be immediate ample support, as there was unquestionable necessity, for two lines at least; and the quicker those could be made, the more numerous would be the branch lines which—as we know by experience on railroads—would immediately be opened. Until Captain Stokes could show that the climate of Torres Strait offered no great obstacle in winter, he should prefer the Chagos route for the mails, and for those passengers who preferred the shorter, though more expensive route; other lines would of course be cheaper for the generality of passengers and for cargoes.

For the wants of North Australia, connection with Singapore was required.

One route would undoubtedly help out another, and both lines would—in his opinion—be soon in operation if the Government would give its attention to so important a subject.

After some remarks and questions from the Bishop of Oxford having reference to a penal settlement in Carpentaria, the discussion on Captain Stokes' paper was adjourned to the next ordinary Meeting.

Twelfth Meeting (Anniversary), 1 p.m., *May* 26, 1856.

The President, Rear-Admiral F. W. BEECHEY, in the Chair.

The Minutes of the previous Meeting were read and confirmed. The Regulations respecting the Anniversary Meetings were next read, when the President appointed Dr. W. B. Baikie and John Brown, Esqrs., Scrutineers for the Ballot.

Blackett Botcherby, Esq., was proposed as a Candidate for Election at the next Meeting.

The Report of the Council, with the Balance-sheet for 1855 and the Estimate for 1856, was then read and adopted.

The President next delivered the Founder's Gold Medal to his Excellency G. M. Dallas, the American Minister, on behalf of Elisha Kent Kane, m.d., of the United States, for his discoveries in the Polar Regions while in command of the American expedition in search of Sir John Franklin and his companions, and for his Memoir and Chart.

The Patron's Gold Medal was presented to Heinrich Barth, ph. dr. of Hamburg, "for his Explorations in Central Africa; his numerous Excursions about Lake Chád; his discovery of the River Bínué; and his Journey to and from Timbuctú."

A Silver Watch and Chain was then presented to Corporal Church, of the Royal Sappers and Miners, for his meritorious and intelligent services in connection with the Central African Expedition.

Corporal Church having been introduced to the Meeting by Lieut.-General Sir John Burgoyne, r.e., received the Watch and Chain through his hands.

The President then read his Anniversary Address, for which a unanimous Vote of Thanks was passed, with a request that he would allow it to be printed. The Ballot being concluded, the Scrutineers reported that the changes advised by the Council had been adopted; and the President announced that Colonel W. H. Sykes was elected to succeed Rear-Admiral W. H. Smyth as Vice-President; and the Right Hon. E. Cardwell, m.p., Captain R. FitzRoy, r.n., Lieut.-Gen. C. R. Fox, the Earl of Harrowby, Lieut.-Gen. Sir G. Pollock, H. D. Seymour, Esq., m.p., and Captain J. L. Stokes, r.n., were elected to fill the vacancies in the number of the ordinary Councillors occasioned by the retirement of Rear-Admiral Sir F. Beaufort, W. Cotton

Oswell, Esq., Lord Overstone, Earl Somers, Lord Stanley, and Sir Gardner Wilkinson.*

The Thanks of the Meeting having been voted to the President, Vice-Presidents, Members of the Council, Auditors, and Scrutineers, the President finally directed the attention of the Meeting to the usual Anniversary Dinner, and the Meeting adjourned at 4 P.M.

Thirteenth Meeting, June 9, 1856.

SIR RODERICK I. MURCHISON, VICE-PRESIDENT, in the Chair.

Hon. Thomas Powys; Captain Frank Vardon; Blackett Botcherby, M.A.; *Thomas Browning; John Torrance; and Robert White, Esqrs. were elected Fellows.*

Attention was called to the arrival of Captain Byron Drury, R.N., F.R.G.S., of H.M.S. 'Pandora,' from the Australian station, with surveys; and to a letter which had been received from Dr. Sutherland, announcing that he had just returned from an exploratory tour in the Quathlamba range of mountains in Natal, and hoped soon to send the results of his observations.

The discussion on Capt. Stokes' Paper on Steam Communication between England, Australia, and the Cape of Good Hope, which had been adjourned at the Meeting of the 12th of May, was continued.

THE CHAIRMAN, in inviting discussion upon the paper, said, that at the previous ordinary Meeting (May 12th) certain objections had been raised in reference to the establishment of a penal colony in the Gulf of Carpentaria, it being apprehended that the climate was too hot for the abode of Englishmen. Captain Stokes had however stated, not only on his own observations but also on those of Flinders and Leichhardt, that the temperature was not too high, and that the country was healthy and fertile. Supposing this view to be correct, there could be no reason why a penal establishment should not be made there, the more so when it was recollected that the head of the Gulf of Carpentaria was more than 400 miles farther from the Equator than Port Essington, where a British station was maintained for many years. A port being formed by convict labour at the head of the Gulf of Carpentaria would, in a very few years, prove to be of incalculable advantage to the northernmost settlements of New South Wales, and our East India and Chinese dependencies, as the risks of Torres Strait would be obviated, and a clear and safe line of navigation would be opened out.

THE SECRETARY then read a letter from Capt. Stokes in answer to questions that had been raised by the Bishop of Oxford and others at the previous Meeting. He stated that the evidence on the subject of climate was remarkably complete, considering the hitherto unoccupied state of the country. Captain Flinders explored the gulf during the summer months, from November to March, and he observed the temperature to vary at that season, when the heat is greatest, from 81° to 90°: "the weather," he states, "was consequently warm, but being alleviated by almost constant breezes, either from sea or land, it was seldom oppressive." This evidence is confirmed by observations taken daily, at sunrise, noon, and sunset, during the months of November and December, in Weymouth Bay, York Peninsula, by Mr. Carron.

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* *The President's Address in full,* will be issued as 'PROCEEDINGS,' No. V.—ED.

For the temperature of the remaining part of the year, or from April to November, there is the evidence of Dr. Leichhardt, who was engaged with a party during three months in traversing the southern shores of Carpentaria. He speaks very highly of the country, and describes the influence of the climate on himself and his companions in these words:—"The state of our health showed how congenial the climate was to the human constitution, for without comforts, without flour or salt, and miserably clothed, we were yet all in health." (Page 299.) As to his cattle, he states that they were in capital condition while passing round the gulf; and further, that cattle, driven by easy stages from the Darling Downs to the Gulf, would fatten on the road.

Captain Stokes' own surveys in Carpentaria, which led to his discovery of the fine country which he named the Plains of Promise, were made during the months of July and August, and were perfectly confirmed by Leichhardt's subsequent journey. The thermometer in those months was observed as low as 50°; and Leichhardt, in drawing the special attention of his readers to the frequent complaints made by his party of cold nights, says, "in fact, we found the air so bracing that we are all in good health." Captain Stokes expressed the opinion that a selected class of convicts might be employed on a system of dispersion, with great advantage, in forming a new settlement in the Gulf of Carpentaria.

With regard to the thick, rainy, and boisterous weather, which Captain FitzRoy seems to fear would impede the navigation of Torres Strait during the western monsoon, it does not appear, from all the evidence Captain Stokes had been able to collect, that there was any cause of apprehension. Thunder squalls occur with rain, but the strongest winds, Flinders found during the season of the westerly monsoon, were from the eastward.

It would almost appear that, perfect as our charts now are along the proposed route, there must be some motive in continuing the brand of great danger to the navigation of Torres Strait. The losses that have occurred on the Barrier Reefs may be attributed to hazardous attempts to *make* Raine's Islet and similar narrow passages, where there are no soundings to guide the navigator, and the currents are generally strong.

Captain Hoseason is the only naval officer who has taken a steamer through Torres Strait. He was delighted with the passage, and compared the reefs and islets to so many natural beacons, as he steamed H.M.S. 'Inflexible' through them at the rate of 10 knots an hour.

An increase has been made in the subsidy from Melbourne, raising it to 75,000*l.*, since this subject was brought on at the last Meeting; rendering it still more apparent that there should be two lines, as already stated; one to Melbourne by the S. coast, and the other to Sydney by Torres Strait. This would allay agitation, and meet the wants as well as gratify the wishes of all the colonists.

CAPTAIN THE HON. H. A. MURRAY, R.N., F.R.G.S., next read a letter from Captain J. C. Hoseason, R.N., who was unavoidably absent, and who expressed himself in favour of Captain Stokes' route *viâ* Torres Strait, *not* as being the best line of communication from *England* to Australia, but as being the best line across the Indian Seas, supposing that it was determined, in the first instance, to send the mails by way of *Suez.* As a means of direct communication between England and Australia he gave a decided preference to the route *viâ* Panama, using the railroad, such as it now existed, across the Isthmus; but if hereafter an inter-oceanic canal should be constructed free from locks, and navigable for large steamers, that route would in his estimation be incomparably superior to all others.

Captain Hoseason mentioned that he had been for three years Nautical rector of a large company established to carry out the Panama line at so rly a period, that nothing but the Russian war, and the consequent high rate f interest for money, stopped its proceedings.

Captain Hoseason also wished to call the attention of the Society to the fact that the railroad has been finished from sea to sea for more than 12 months; that it is only 49 miles in length; that 700 or 800 passengers are carried across in about three hours; and that the passengers and mails which arrive in Navy Bay from New York in the forenoon, are carried across and sail from Panama to San Francisco, or to Peru and Chile, in the evening of the same day. Also that about 70,000 passengers and 12 millions sterling of specie were carried over the Isthmus last year; that the trade is now most rapidly increasing, and that cargo of all kinds is being carried across; valuable goods, common mercantile goods, such as coal, hides, ice; in fact, any thing and every thing. Anthracite coal in large quantities is now sent direct to the Pacific from New York *viâ* Navy Bay and Panama. Five enormous steam lines concentrate at the Isthmus of Panama alone; two from America to Navy Bay, the Royal West India Mail Company, an American line from Panama to San Francisco, and the English Pacific Company to Peru and Chile.

All these facts, as well as the peculiar advantages which the Panama route offers, owing to favourable winds and moderate weather, are fully detailed in a pamphlet now in possession of the Society, which is addressed by the directors of the Australian Direct Steam Navigation Company to Lord Canning, then Postmaster-General, and which had chiefly been compiled by Captain Hoseason and his late colleague, Captain A. S. Hamond, R.N., both of whom have had considerable experience in those seas while in command of war steamers; the former officer having run his vessel upwards of 70,000 miles, during which time he daily chronicled those oceanic phenomena which entitle his opinion to so much weight.

MR. J. CRAWFURD, F.R.G.S., said that he believed the climate of the southern portion of the Gulf of Carpentaria to be unfavourable. The country was not a tableland, but was almost at the sea level, certainly nowhere 300 feet in elevation. No person who had been in such a country within the tropics could believe it to be one in which Europeans could labour. The lowest temperature of winter was 50°, while the heat of summer was excessive, amounting to 89° or 90°, being 5° or 6° greater than the very Equator. Besides this no distant mountains had been discovered, and consequently no water applicable to irrigation. On comparing the country with one of which much had been lately said, Central America, the great advantage of the latter over it would be evident. Instead of a lowland, Central America presented a tableland rising to a height of 3000 up to 8000 feet, thus giving lands at all elevations fit for the growth of every kind of produce. In addition to this, much of the land was volcanic, and therefore was pretty sure of being fertile. He consequently persevered in saying that the Gulf of Carpentaria was totally unfit for European labour.

CAPTAIN STOKES, R.N., F.R.G.S., believed that the supply of water was good, as Leichhardt had crossed numerous streams there, in addition to those which he had himself previously discovered and surveyed. The existence of highland had not been proved to the southward of the gulf, but it had been certainly found both eastward and westward. From the observations of Flinders during the summer months, from November to March, he believed that the heat was not oppressive; and the evidence of Leichhardt was conclusive as to the healthiness of the climate.

MR. HOVELL, F.R.G.S., who had been forty-three years in Australia, and made the first overland journey to Port Phillip in 1824, entered into the question of convict-labour, stating his belief that transportation, and assignment of convicts to private service, was the most humane mode of punishment that *had ever been adopted. He believed* that the climate about the Gulf of Carpentaria was very good, though he had never been nearer to the district than Torres Strait.

MR. G. F. LESLIE, F.R.G.S., referred to the question of steam communication. It was the wish of the Australian colonists to have a speedy, direct, and immediate communication with England by the shortest route. The island of Diego Garcia, which had been proposed as a coal station, presented several drawbacks, since, before it could be so used, lighthouses and coal depôts must be constructed. As considerable time would thus be taken to prepare it, this plan must for the present be set aside, the requirements of the colonies being immediate. The selection of either of the islands of Mauritius or Ceylon seemed to be a matter of indifference, since the route by either would be about the same. It had been shown that the expense need be no obstacle, as the sum of 50,000*l.*, and afterwards an additional sum of 25,000*l.*, had been voted by the colony of Victoria towards this object. A like sum, which the Imperial Government had proposed to give, places 150,000*l.* at immediate disposal, and this will be found quite sufficient. With reference to the route by Torres Strait, he agreed with Captain Stokes that it would be the most direct; and if the selection would not be attended with the same disadvantages as that by Diego Garcia, viz., the necessity for lighthouses and buoys to mark out a safe passage, he had no hesitation in saying that it would be by far the best. There were some reasons why the preference should be given to the Mauritius route, because then the Cape of Good Hope could be connected with the line, which would be a great benefit to that colony. The Atlantic had been ploughed, both in winter and summer, at the rate of ten knots an hour, and therefore he concluded that the Indian Ocean might be traversed with the same speed. Should a line of communication be established from Australia to Ceylon, and from thence to Suez, he believed that within twelve months it would be found requisite to establish an independent line through Torres Strait to Singapore, to meet the requirements of the commerce between Australia and India, which is very extensive and daily increasing.

With reference to the establishment of a penal colony on the Gulf of Carpentaria, he thought it would be most injudicious, and certainly most distasteful to nine-tenths of the Australian colonists. He had experience in the assignment system for several years before its termination, and believed it to be in many respects most iniquitous. Another objection he conceived to be the fact, that within the last five years the colonists had penetrated with flocks and herds from Wide Bay to within 600 miles of the gulf, and that during the next five years they would reach it. He would propose instead, that the neighbourhood of the Victoria River of Stokes should be chosen as the site of a new penal settlement. It was, he believed, fertile, and suited to the growth of cotton.

COLONEL EVEREST, F.R.G.S., agreed with Mr. Crawfurd in the main in his objections; but he observed that climate does not depend merely on the distance of a place from the Equator. He would refer to the case of St. John's in Newfoundland, where even oats would not ripen, although it was several degrees nearer the Equator than London. He thought it would be better to determine, before proceeding farther with the question of a penal settlement, whether the elevated land supposed to exist in the vicinity of the gulf was real or imaginary.

2. *Remarks on the Isthmus of Cupica.* By Admiral ILLINGWORTH.

Communicated by ROBERT STEPHENSON, Esq., M.P., F.R.G.S.

IN the commencement of the year 1820, and during the war of Independence in South America, the then Captain and afterwards Admiral

Illingworth, of the Colombian service, crossed the isthmus of Cupica at the head of a party of seamen and marines belonging to a sloop of war under his command. He descended by the river Napipi into the Atrato, the object of his expedition being to assist in the capture of some Spanish gun-boats, which had been sent from Carthagena to invade the towns situated at the head of the Atrato.

The better to effect the purpose of his expedition and to capture canoes for embarking his men on the Napipi, Admiral Illingworth caused a six-oared boat to be carried up the eminence which rises some 200 feet above the level of the sea, behind the bay of Cupica. From that position the course of the river Napipi can be clearly discerned; and were it not for the impenetrable forest which descends thence to the valley of the Atrato, this deep and splendid Atlantic stream might be fully traced by an observer stationed on the hills in question, above the bay of Cupica.

Admiral Illingworth's boat was dragged for about six hours' march on foot along the Indian path, which, leaving the bay of Cupica, reaches the river Napipi in a direction almost at right angles to its course, at a point where boats and canoes can navigate it even in the dry season.

Admiral Illingworth in his boat, and his men in canoes, proceeded to the only farm to be found on the Napipi, and starting thence early in the morning, he arrived in the river Atrato about nine or ten o'clock A.M., the Napipi being in its lower part a deep and winding stream.

After having fulfilled the objects of his expedition, Admiral Illingworth left his boat in the Atrato, at the solicitation of the Governor of the province; and as it was the first vessel known to have passed from one ocean to the other, it was preserved for many years under a shed, in the town of Citará, as a curiosity.

There is also another point worthy of attention in that section of the isthmus of Panama, namely, the very narrow neck of land which divides the head of the Atlantic river Atrato and that of the St. John's River, which descends into the Pacific in about 4° N. lat., that is to say, about 100 leagues to the south or windward of Panama. The Indians, as well as merchants, drag their canoes from one river to the other with great ease, and indeed a sort of canal is formed by this constant operation, which is called "el Canal de la Raspadura." It is moreover stated by the Indians in that part of the country, that a very easy communication is to be obtained between Baudó, an Indian town on the Pacific, and the Atrato.

3. *Survey of the Isthmus of Darien, between the Gulf of San Miguel and Caledonia Bay.* By LIONEL GISBORNE, M.A., C.E., F.R.G.S.

THIS is the second expedition to Darien, of which Mr. Gisborne has had charge. The object of both was to examine the country between San Miguel and Port Escoces, and the results of the first are published in vol. 23 of the Royal Geographical Society's Journal. Owing to the continued hostility of the native Indians, he believed that no party, since the time of the Buccaneers, in 1684, had ever obtained a footing in the country, with the exception of Milla's; Patterson's; and his own.

Mr. Gisborne's expedition was commenced with the co-operation of the Governments of England, France, America, and New Granada, which sent officers to report on the results of the survey, and stationed ships to protect the explorers. A first attempt showed that success was impossible to the very large party with which Mr. Gisborne started; he returned to the ships, and then, accompanied by Lieut. St. John and two sailors, and guided by Indians, he ascended the Caledonia River, crossed the Cordilleras, went some distance down the Sucubdi River, and then, striking N.W., reached Mr. Forde's head-quarters on the opposite side of the isthmus. An attempt to recross by another route proved unsuccessful. He relates the disasters that befell two parties who started a very short time before his own, those of Capt. Prevost and of Lieut. Strain. At the request of Mr. Gisborne, a boat was despatched from H.M.S. 'Virago' in search of the survivors of the latter party, who were discovered, after five days, in a most deplorable state of destitution.

The result of Mr. Gisborne's survey shows that the harbours of Caledonia and Darien are excellent, and in every way adapted as the termini of an inter-oceanic canal. The coast on the Atlantic side was found to be seven miles wrongly laid down in longitude, and a range of mountains, from 900 to 1600 feet high, was proved to form the parting of the country at a distance of about five miles from the Atlantic. This water parting is precipitous, being, at a distance of five miles westward, only 200 feet above the mean level of the oceans. The distance between tidal waters on opposite coasts is under 30 miles. A track chart of the Chuqunaque has been made nearly as high as the Loma Deseada, at the confluence of the Sucubdi, which agrees in a very remarkable manner with the copy of the map made to show Milla's route in 1787-8, a tracing of which was given to Mr. Gisborne by Colonel Codazzi. The result of this last survey is demonstrative of the fact that canalization across, without tunnelling, is here impracticable; but it also proves that a railway might be constructed between excellent ports not above 12 leagues apart, with a summit level, to be crossed, not exceeding 300 yards above the sea.*

Mr. Gisborne remarks, with reference to the practicability of a complete survey of the isthmus, before deciding on a line for making an inter-oceanic canal, that "wherever the best spot may be, two elements must necessarily exist—good harbours (or the means of making them) and a short distance. This limits the inquiry to a very few places, and those can be reduced to two or three by a cursory examination. Two surveying vessels on each coast could in a few months examine the unsurveyed portions of Central America sufficiently to decide where good harbours, or facilities for making them, exist. It is not probable that many such places will be found opposite each other; where such is the case, a general examination of the interior would soon eliminate the impossibles, leaving perhaps two or three places where a more careful and detailed examination may be necessary."

Dr. Hodgkin begged to introduce to the Society, General Mercer, of the United States, who had been the chairman of a committee for reporting on an inter-oceanic communication through Central America.

General Mercer said that his friend Dr. Hodgkin had taken him entirely by surprise in mentioning his name; but being invited also by the Chairman of the Meeting, however incompetent, for many reasons, to cast any additional light on the subject under debate, he would not resist the compliment paid him. More than eighteen years had elapsed since the duty had devolved on him, as a member of a standing committee of the House of Representatives of the United States of America, to make a report to that body, on a memorial from certain citizens of New York and Philadelphia, on the practicability and mode of providing for the construction of a navigable ship canal between the Atlantic and Pacific oceans.

He had despaired of obtaining, through any channel then accessible, the facts necessary to guide even his own opinion upon a subject of the importance of which he had long been aware, when he accidentally found, in a work on Guatemala, by a British official agent, a table furnishing the distance, and a series of levels taken at every hundred yards of the intervening high land between Lake Nicaragua and the Pacific Ocean. From this it appeared that the distance overland, was but 17 miles and 350 yards; and the elevation of the surface of the lake above the Pacific but 134 feet; that for 9 miles from the ocean, the ground regularly descended towards it from the level of the lake, over a surface in all respects favourable for a canal of any dimensions. For the 8 miles next to the lake, serious difficulties, although not insurmountable, were presented, in the elevation of the ground, often rock, above the level of the lake, to heights averaging, for 6 miles, more than 60 feet; for 2 miles of that distance, 135 feet; and for one-third of a mile, 150 feet.

General Mercer said, that the canal was designed by him, to have a depth of 26 feet, the draught of a large frigate; but was enlarged, at the suggestion of the United States engineers, to a depth of 30 feet, with a breadth sufficient to permit two of the largest ships to pass each other.

The deep cutting from the lake to the Pacific, was not unexampled, even in Mexico. But supposing a tunnel to be dispensed with, and its continued depth extended for several miles more than that example warranted, yet it involved only an additional cost. He did not hesitate, therefore, in inducing the committee to report in favour of the practicability of uniting Lake Nicaragua with the Pacific, and using the Lake as a feeder, if not embraced in the direct communication with the river St. Juan, which was navigable to the Atlantic at most seasons of the year, by vessels of shallow draught.

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* *See Map to accompany Capt.* Prevost's paper, in vol. xxiv. p. 256.—Ed.

He did not believe, as the Lake was of great dimensions—not less than 200 miles in circumference, and if shoal in some places, in others deep enough for ships of any size—that it would fail of supplying a sufficient quantity of water for a constant navigation, by means of locks, from sea to sea. The use of it for twenty-four hours would not, he believed, reduce the level of its surface 2 inches, if in that time it received no supply from Lake Leon, which lies N. of it, and disembogues the water, received from various streams, into Lake Nicaragua, by a river of rapid current.

Assuming it as a universal truth, that wherever there is a perpetually descending navigable river, supplying a sufficient quantity of water for a navigable canal, such a canal can be made, the Committee of the House of Representatives, without other data, deemed the whole line of navigation for the largest ships, from the Pacific through, or by, Lake Nicaragua and down the St. Juan to the Atlantic, practicable. Of the cost of such a work they could pronounce no judgment. Of the quantity of materials of earth and rock to be removed, in order to open that part of it, in which a line of levels had been supplied by Thompson's work on Guatemala, they were furnished with a hasty estimate by the Topographical Bureau of the War Department of the United States, which made it with no other assistance, than from the cross-section of the ground which the canal would pass on the line already surveyed. Those materials exceeded 44 millions of cubic yards.

From the profile of the entire line, and information derived from the construction of a canal of 186 miles, leading from the city of Washington, along the river Potomac, through many lofty mountains, the Chairman of the Committee, availing himself of further information as to the general aspect of the country between the Lake and the Pacific, was led to compute the cost of so much of the line of proposed navigation, at 20 millions of dollars, or about 4 millions of pounds sterling. This, he admits, was rather a guess than an estimate; but he entertained no doubt of the practicability of the construction of the entire work, for a sum much less than its value, which is beyond all computation.

General Mercer said, that he brought with him to Europe, near three years ago, two copies of the Report of the Committee on Roads, Canals, and Internal Navigation of the year 1838, on this subject. He despaired, on account of the then existing war, of being able to use it with any practical effect, although the construction of the canal, with only one other object of public interest, had led him, at a very advanced age, to make a seventh voyage across the Atlantic since the commencement of the present century, having made his first in 1802.

Great Britain had a much deeper interest than France, in uniting with America, in constructing the proposed canal. It has been rumoured, not without circumstantial evidence of its truth, that an effort is to be made, which, if made, will doubtless be successful, to unite the Red Sea with the Mediterranean, by a canal through the Isthmus of Suez, where, it is believed, a canal formerly existed. If successful, one effect of it will be obvious, that France, Austria, and Russia, Italy and Greece, will be on the water line of communication between England and her possessions, from 1500 to 2000 miles nearer to those possessions, than she will herself be. It is therefore much to her interest to shorten, if practicable, her distance from them, by way of the Atlantic and Pacific, by uniting those oceans as now proposed.

In the Appendix to the Report of the Committee, occupying 160 pages, *reference was made to* the history of several companies formed for the execution *of the Nicaragua* and other lines of inter-oceanic communication across the

Isthmus of Central America. The Report recommended the survey of one of them, near which a railroad has since been constructed. It furnished the Holland contract for that through Lake Nicaragua, to which the King of Holland subscribed half a million of guilders. This subscription was abandoned, the subsequent severance of Belgium from Holland having proved fatal to the renewal of the efforts of the Dutch to execute this work; and at present it is probable that, without the interposition and some concurrent arrangement between the Governments of those States most interested in its execution, it may yet be long delayed, if ever executed. Before he concluded, General Mercer begged to observe that he owed it to Mr. Kelley of New York to say, what we must all think, that if, by an open cut from sea to sea, and the Atrato and Truando rivers, a navigable canal of the dimensions which he proposes can be constructed, it is greatly to be preferred to any communication between those oceans by locks; for, however they may be multiplied and provided with intervening pools of water, of sufficient dimensions to facilitate and hasten the passage through them of very large ships, it may be questioned whether there would not be very inconvenient delay often incurred, and the utility of the entire line of intercommunication be impeded, by the number of vessels seeking a passage through the locks. The only doubt that as yet appears to hang over the Atrato route, arises from the possible insalubrity of the country through which it is to pass.

A Visitor having asked General Mercer if the climate on the Nicaragua route would be unhealthy, he answered, that it was probable that it would not be so, as several considerable cities existed in its vicinity, and a road through it to the Lake and the river St. Juan had been, for several years, used for the transit of persons and property passing between the States of Oregon and California, both to and from the United States, without a complaint or a suggestion having been heard that the climate is unfavourable to health.

He acknowledged the inquiry to be most pertinent, as ill health would constitute a very serious impediment to the progress of a work so laborious, and would greatly enhance its cost. He had heard it said at New Orleans, that the very beautiful road between that city and Lake Pontchartrain, was made of oyster-shells and Irishmen.

The Chairman, in conclusion, said that these propositions of American citizens, were in every way entitled to the consideration of the Society, especially that which had been made by Mr. Kelley, and to which General Mercer, of the United States, gave the preference over the Nicaragua route, as examined by himself. It was most important to bear in mind, that Mr. Kelley came from America, chiefly for the purpose of inducing the English and French Governments to unite with the American authorities in a great joint geographical survey of the whole of the Darien territory, with the view of finally determining upon the best line for the construction of a great canal without locks, and by which the largest vessels might pass.

He heartily wished that Mr. Kelley might succeed in this great and philanthropic project, which so deeply interested all civilized nations.

Fourteenth Meeting, June 23, 1856 (*last Meeting of the Session*).

Rear-Admiral F. W. BEECHEY, President, in the Chair.

Messrs. W. Ferguson, John Torrance, and H. J. Williams were officially introduced upon their election.

Professor P. A. Munch, of the University of Christiania, was, upon the recommendation of the Council, elected a Corresponding Member;

and Messrs. Daniel Brown; Samuel Brown; A. Henderson; P. C. Lovet; A. Macgregor; and W. R. O'Byrne; Capt. John Shepherd, R.N.; *Sir J. P. Kay Shuttleworth, Bart.; Messrs. K. L. Sutherland,* R.N.; *G. C. Taylor; and Lieut.-Colonel F. E. Wilmot,* R.A., *were elected Fellows.*

Messrs. J. B. Heath; Arthur Hodgson, of Australia; W. H. Hovell, of Australia; W. P. Andrew; Capt. Cole; Messrs. J. Entwisle and G. K. Fairholme; Colonel the Hon. A. H. Gordon, C.B.; Sir Charles Nicolson, of Sydney; Commander Montagu O'Reilly, R.N.; and Mr. William Staniland, were proposed as candidates for election at the opening meeting of the next session.

An ancient Atlas and Portulan of Spain were exhibited by Sir Thomas Phillips, F.R.G.S.; also the new edition of Baily's Map of Central America, by Mr. Stanford, F.R.G.S.

The Papers read were—

1. *Journey of Joachim Rodriguez Graça to the Muata ya Nvo.* By W. D. COOLEY, Esq., F.R.G.S.

MR. COOLEY endeavours to establish the position of the Muropue's (Muata ya Nvo) capital, and he collates the itinerary of Graça, who travelled in 1843, with those of Lacerda, Texeira, and the Pombeiros, or native travelling merchants. Finally, he examines critically into the information collected by Dr. Livingston about the courses of the several rivers which he crossed, and disagrees widely from him.* He places the capital of the Muropue at about 8° S. lat. and 22° E. long.

2. *Letter from Dr. Livingston, with a Sketch Map.*

THIS letter was dated Cabango, Lunda country, May 17, 1855. Its object was to make certain corrections in his first map of the country adjacent to the Quango, through which he had passed in very cloudy weather on his outward journey, which corrections of Dr. Livingston had all been attended to by Mr. Arrowsmith in engraving the map which accompanies his paper in the lately-issued volume of the Royal Geographical Society's Journal, and it is, therefore, unnecessary to notice them at length.

In reference to these papers MR. MACQUEEN pointed out that the subject of them was the same as that of the latter part of his paper of December 10, 1855, which was only partially read to the Society, but in which he had arrived at very different conclusions from Mr. Cooley. He had consulted everything he could find upon the subject, including the authorities from which Mr. Cooley had formed his opinions, and he believed that that gentleman's views were quite erroneous. He conceived that the main direction of the streams in question was to the N.E., and not to the N.W. Of these the Casai was one of the most important, and it certainly ran to the E., and not to the W., as Graça says. This view was confirmed by the reports of the Arabs who crossed from Benguela to the East Coast. Dr. Livingston deserved the greatest credit for the correction he had made. The difficulty in making observations in a country like this was immense, and it is only a matter of wonder that he has made so few mistakes. No traveller had done so much for African geography as Livingston, and he hoped that this country would not allow him to go unrewarded.

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* *At the time of* writing his Paper, Mr. Cooley had not seen Dr. Livingston's *last communication.—*ED.

SIR RODERICK MURCHISON paid a tribute of respect to the merits both of Mr. Cooley and Mr. Macqueen for their great labour and research. He was sure that the Society could but hope that the report of Dr. Livington's safe arrival at Teté * was true. That remarkable man was the only European who had traversed and retraversed South Africa; he was not merely an explorer, but a scientific observer; and the accuracy of his statements was well known. Sir R. Murchison therefore believed that Dr. Livingston would have among geographers, a reception fully as warm as that given to General Williams by the British nation.

MR. GALTON cordially joined in the expressions of gratitude offered to Dr. Livingston on behalf of African geography, for he had made a certainty of so many important questions that had before been matters of pure speculation. Members of the Society were aware that an expedition would probably be sent before long to Eastern Africa, and he thought it due to the just appreciation of any discoveries it might make, that geographers should take note of our present state of exceeding ignorance about the whole interior of that continent, notwithstanding that so much learned and ingenious labour had been spent in endeavouring to determine it. He would simply beg the Society to glance at three maps which were hung in different parts of the room in which they were assembled: two of them represented the respective opinions of Mr. Cooley and Mr. Macqueen, two of our best informed African geographers; the third was the compilation of Mr. Erhardt, from most abundant native testimony; and yet these three maps were as utterly dissimilar and discordant in all their physical features as it was well possible to imagine.

THE PRESIDENT said that all would concur with Mr. Macqueen as to the difficulty of making observations in a country like Africa, where not only the land itself, but the climate also, was so much against them. The observations of Dr. Livingston had been submitted to Mr. Maclear, the astronomer at the Cape, and had been highly approved of by him.

He would here say a few words on the expedition to Eastern Africa referred to by Mr. Galton. The expedition was to start from the East coast, and to explore the region of Lake Nyassi, and the country between it and the Indian Ocean. The Lake was, according to Mr. Erhardt's estimation, 600 miles in length, by 300 in breadth. The district around it abounded in copper, and was thickly populated. Since Mr. Erhardt's paper was read, the Council of the Society had been in communication with the Government respecting an expedition to the country, which, if it took place, would be conducted by men of enterprise.

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* Report received from Mr. Sunley, writing from Mozambique.—ED.

3. *Routes between the Danube and the Black Sea at Kustendji.* By Captain SPRATT, R.N., C.B., of H.M.S. 'Spitfire.'

Communicated by Captain J. WASHINGTON, R.N., F.R.G.S.

THIS communication was written at the outbreak of the war, but has been received only a few days since by the Society. Captain Spratt considers the lakes along the Kara Su valley to be a mere backwater of the Danube, and that they could be fitted for the navigation of barges without much difficulty. The remaining twenty-three miles, to the Black Sea, might be traversed by carrying the barges on wheels along a tram-way to the sea at Kustendji, where a breakwater would have to be constructed to shelter them. The absence of any port at that place would render an ordinary ship-canal between the Black Sea and the Danube of little value. Captain Spratt gives itineraries of the routes as they exist at present, and remarks on the value of Kustendji in a military point of view.

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4. *The Landfall of Columbus, or the Land which was first reached by him.* By Captain A. B. BECHER, R.N., F.R.G.S.

Two islands have hitherto shared this honour—Cat Island, the claims of which were urged by Washington Irving and subsequently supported by Baron Humboldt; and Grand Turk Island, adopted by Señor Navarrete, who has also published all that remains of Columbus' original journal. It is by availing himself of this publication that Captain Becher has come to the conclusion, suggested by Señor Muñoz, that a third island, Watling Island, was really the land in question. Columbus' own words are: "It is a tolerably large island, with fine trees and a large lake in the middle of it; it has no mountains, and is covered with verdure, which is pleasing to the eye." Watling Island is eaten out by a salt-water lake, its highest part is not more than 140 feet above the sea, and it is now called the Garden of the Bahamas. Captain Becher shows that Columbus did not water his ships there, though he must clearly have been in great want of water, and therefore that this lake must have been salt water and unfit to drink. From this point he traces him step by step to the port of Nipé, in Cuba, which appears to be identified beyond question.

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5. The Secretary next read a letter from Captain J. Lort Stokes, R.N., F.R.G.S., communicating the opinion of Captain Richards, R.N., on the expediency of despatching a vessel at once, in search of the relics of the 'Erebus' and 'Terror.' Captain Richards, whose experience in Arctic travelling is so well known, says:—

"I think either of three routes might be adopted, viz., one to King W
Land, by Behring Strait, as proposed by Captain Collinson; another th
Hudson Strait to Repulse Bay; and a third through Lancaster Sound t
Channel, or Prince Regent Inlet. To the last I decidedly give the pref
for the following reason:—No vessel has yet reached so far as Captain (
son's farthest in one season; and to do it in two would expend the res
and render the people unfit for searching by sledges (the only method).
plan, then, would be to select a screw vessel of convenient size, and forti
She would have a complement of seventy men, and be provisioned f
years. I would require no tender or second vessel. She would proceed
Peel Channel as far as possible; but should Peel Channel be imprac
(which I do not believe), then put the ship in the neighbourhood of Bre
Bay in Prince Regent Inlet. Once in a berth for winter, commence yo
velling operations. Much can be done in the same autumn, but the grea
neys must be taken in the following spring. Both sides of Peel Channel a
as King William Land and Gateshead Island must be explored. If the sh
their wrecks are not found there—and I think they will be—continue the
up both sides of King William Land to Montreal Island, at the embouch
the Great Fish River. Another portion will yet remain to be examined. Be
Osborn's and Wynniatt's farthest there is a space of sixty miles. Thi
be a strait, and may communicate with the head of Peel Channel, mak
island of Prince of Wales Land. It is possible that Franklin may
passed to the south-west of Cape Walker with his vessels, and be block
here. The exploration of these lines of coast by sledges could, I belie
satisfactorily done by the force I have named; and there is a conviction
mind, amounting to certainty, that the fate of Franklin would be solve
the remains of his ships be found."

6. The following memorial to Lord Palmerston was then read l
Roderick Murchison, F.R.G.S.:—

"London, June, 1

"My Lord,—Impressed with the belief that Her Majesty's missing
the 'Erebus' and 'Terror,' or their remains, are still frozen up at n
distance from the spot whence certain relics of Sir John Franklin a
crews were obtained by Dr. Rae, we whose names are undersigned, w
men of science and others who have taken a deep interest in Arctic disc
or explorers who have been employed in the search for our lost count
beg earnestly to impress upon your Lordship the desirableness of sendi
an expedition to satisfy the honour of our country, and clear up a m
which has excited the sympathy of the civilised world.

"This request is supported by many persons well versed in Arctic su
who, seeing that the proposed expedition is to be directed to one limit
only, are of opinion that the object is attainable and with little risk.

"We can scarcely believe that the British Government, which to it
credit has made so many efforts in various directions to discover even th
pursued by Franklin, should cease to prosecute research, now that the l
has been clearly indicated where the vessels or their remains must l
cluding, as we hope, records which will throw fresh light on Arctic geog
and dispel the obscurity in which the voyage and fate of our coun
are still involved.

"Although most persons have arrived at the conclusion that there ca
survivors of Franklin's expedition, yet there are eminent men in o
country, and in America, who hold a contrary opinion. Dr. Kane,
United States, for example, who has distinguished himself by pushing
to the north in the search for Franklin than any other individual,
whom the Royal Geographical Society has recently awarded its Founder
Medal, thus speaks:—

" 'I am really in doubt as to the preservation of human life. I well know how glad I would have been, had my duty to others permitted me, to have taken refuge among the Esquimaux of Smith Strait and Etah Bay. Strange as it may seem to you, we regarded the coarse life of these people with eyes of envy, and did not doubt but that we could have lived in comfort upon their resources. It required all my powers, moral and physical, to prevent my men from deserting to the Walrus Settlements, and it was my final intention to have taken to Esquimaux life, had Providence not carried us through in our hazardous escape.'

" But, passing from speculation, and confining ourselves alone to the question of finding the missing ships or their records, we would observe that no land expedition down the Back River, like that which, with great difficulty, recently reached Montreal Island, can satisfactorily accomplish the end we have in view. The frail birch-bark canoes in which Mr. Anderson conducted his search with so much ability, the dangers of the river, the sterile nature of the track near its embouchure, and the necessary failure of provisions, prevented the commencement even of such a search as can alone be satisfactorily and thoroughly accomplished by the crew of a man-of-war, to say nothing of the moral influence of a strong armed party remaining in the vicinity of the spo until the confidence of the natives be obtained.

" Many Arctic explorers, independent of those whose names are appended and who are now absent on service, have expressed their belief that there are several routes by which a screw vessel could so closely approach the area in question, as to clear up all doubt.

" In respect to one of these courses, or that by Behring Strait, along the coast of North America, we know that a single sailing vessel passed to Cambridge Bay, within 150 miles of the mouth of the Back River, and returned home unscathed; its commander having expressed his conviction that the passage in question is so constantly open, that ships can navigate it without difficulty in one season. Other routes, whether by Regent Inlet, Peel Sound, or across from Repulse Bay, are preferred by officers whose experience in Arctic matters entitles them to every consideration; whilst, in reference to two of these routes, it is right to state that vast quantities of provisions have been left in their vicinity.

" Without venturing to suggest which of these plans should be adopted, we earnestly beg your Lordship to sanction without delay such an expedition as, in the judgment of a committee of Arctic voyagers and geographers, may be considered best adapted to secure the object.

" We would ask your Lordship to reflect upon the great difference between a clearly defined voyage to a narrow and circumscribed area, within which the missing vessels or their remains must lie, and those former necessarily tentative explorations in various directions, the frequent allusions to the difficulty of which, in regions far to the north of the voyage now contemplated, have led the majority of persons, unacquainted with geography, to suppose that such a modified and limited attempt as that which we propose involves further risk, and may call for future researches. The very nature of the former expeditions exposed them, it is true, to risk, since regions had to be traversed which were totally unknown; while the search we ask for is to be directed to a circumscribed area, the confines of which have been already reached without difficulty by one of Her Majesty's vessels.

" Now, inasmuch as France, after repeated fruitless efforts to ascertain the fate of La Pérouse, no sooner heard of the discovery of some relics of that eminent navigator than she sent out a searching expedition to collect every fragment pertaining to his vessels, so we trust that those Arctic researches which have reflected much honour upon our country, may not be abandoned at *the very moment*, when an explanation of the wanderings and fate of our last *navigators, seems* to be within our grasp.

"In conclusion, we further earnestly pray that it may not be left to the efforts of individuals of another and kindred nation already so distinguished in this cause, nor yet to the noble-minded widow of our lamented friend, to make an endeavour which can be so much more effectively carried out by the British Government.

"We have the honour to be, my Lord,
"Your Lordship's obedient Servants,

"F. Beaufort,
Rod. I. Murchison,
Wrottesley,
Egerton Ellesmere,
F. W. Beechey,
Richard Collinson,
Charles G. B. Daubeney,
W. Whewell,
W. H. Sykes,
John Fergus,
P. E. de Strzelecki,
W. H. Smyth,
Ashhurst Majendie,
Robt. FitzRoy,
E. Gardiner Fishbourne,
Robert Brown,
Geo. Macartney,
Leonard Horner,
W. Henry Fitton,
Lyon Playfair,
Thomas Thorp,
Charles Wheatstone,
Wm. Jackson Hooker,
Jos. D. Hooker,
John Arrowsmith,
Peter La Trobe,
W. A. B. Hamilton,
Robert Stephenson,
J. E. Portlock,
C. Piazzi Smyth,
C. W. Pasley,
George Rennie,
J. P. Gassiot,
C. B. Airy,
J. F. Burgoyne.

"*The Right Hon. Viscount Palmerston, M.P., G.C.B.*"

In addition to the above mentioned, many officers of the Royal Navy who have been employed in the search after Franklin, and who are now absent from London, have previously expressed themselves to be favourable to the final expedition recommended.

7. It was next announced that Mr. A. W. Wallace, F.R.G.S., had returned to Singapore from his expedition to Borneo, and was preparing to visit Celebes, where he hoped to explore portions of that island hitherto unknown, as well as islands of the Molucca group. At the request of the Council, Mr. Wallace has been furnished, through the kindness of Lord Clarendon, with letters of introduction from the Governments of Holland and of Spain, to the authorities of their different colonies in the East.

8. The Chairman then adjourned the Meeting to the 10th of November.

ADDITIONAL NOTICES.

1. *The Cape Palmas Settlement of Liberated Negroes.* By PHILIP SCHÖNLEIN.

Communicated by Dr. HODGKIN, F.R.G.S.

Cape Palmas, 28th September, 1855.

THE apparent object of the Colonization Society, in re-transporting the coloured people to the land of their fathers, has been, I think, to make them cultivate the soil, and thereby not only to improve their own condition, but to set the natives an example of the blessings of agriculture. This, however, has been attained in a very limited degree, the chief obstacle being the facility for making money on a small scale afforded by the trade with the natives. It seems that this evil has been fully foreseen by the Society, for I found in its 'Collection of Ordinances' a clause which forbids trade with the natives, except in articles of food, to all but those who had taken out a licence. I think, however, the exact line of distinction between articles of food and those adapted for commerce is difficult to mark out, especially in Africa, where the very same fruit, the palm-nut, furnishes the chief commercial commodity, and, at the same time, an important national dish—the so-called palm-butter. However that may be, ever since the declaration of independence that law has been entirely disregarded. At present, by far the greater part of the settlers confine themselves to the cultivation of fruits and vegetables, little exceeding in quantity their own wants; for the rest of their earnings they depend on the trade with the natives, either by carrying it on on a small scale for their own account, or by working on board one of the small coasting vessels belonging to the wealthier members of the community. In general, the poorer classes of the people here, prefer working for wages to working on their own farms. One of them said very significantly, when he spent a day in planting potatoes in his own garden, he got the worth of his day's labour only in three months, by selling the potatoes; but when he worked in another man's employ, he got his pay at the end of the week. A great number of the colonists, especially mechanics, are constantly employed at Government works, or at buildings erected at the expense and for the purpose of the different missionary societies. The best proof that I could allege for the truth of what I have mentioned is the fact, that notwithstanding a peaceable existence of twenty-one years, the colony does not produce a single penny's-worth of the merchandise exported, it being entirely derived from the trade with the natives. And yet the soil throughout the colony is eminently fertile: all African and West Indian fruits and vegetables grow luxuriantly, but they are raised *on so small a scale* that foreign vessels trading on this coast seldom, if ever, take in fresh provisions at Cape Palmas, on account of their being too dear. Indigo is growing wild on the Cape, covering acres of ground; the senna shrub and the castor-oil plant may be seen everywhere. But it has been found out that the soil is particularly well fitted for the cultivation of coffee. The bean is said to be of a better flavour than that grown in the Brazils; besides that, the tree grows faster and yields a more abundant crop than in the latter country. Notwithstanding this important discovery, coffee is but little cultivated, and those who grow it at all, have, for the greater part, but a few trees in their gardens, producing one or two dozen pounds a *year. Here, however,* I am glad to have to state an honourable exception *which shows what can* be done in a comparatively short time.

Mr. Smith arrived here from America in the fall of 1850, and now, after only two years, he has nine acres carefully planted with coffee trees, which, in two years more, promise to yield an abundant crop. This man, working hard all the time from his first arrival, has suffered less from the fever than many idlers, who make the latter disease an excuse for their avoiding exercise. Sugar might also be raised advantageously in the colony; but it is true that this would require machinery, and consequently an outlay of capital beyond the reach of most of the settlers. A coloured gentleman, one of the chief palm-oil traders of this place, seemed to think, however, that the want of machinery was but a minor obstacle; "for," said he, "what our people want more than sugar mills, and what it would be more difficult to give them, is energy and perseverance to plant, keep the plantations clean, and cut the cane."

The astonishing discrepancy which manifests itself in the progress of this colony and that of its more northerly sister, Monrovia, can only be accounted for by taking into consideration the difference of the sources from which the populations of both are derived. Monrovia, Marshall, and Bassa Cove have been settled by the American Colonization Society; Sinou, by those of Pennsylvania and Mississippi. In these places, therefore, a large part of the inhabitants consists of highly-educated persons from the free states, where the coloured people are not in the same measure deprived of schools and facilities for acquiring useful knowledge, as in the southern or slave states. The settlement at Cape Palmas having been formed by the Maryland Colonization Society, with a view to be chiefly peopled by the coloured inhabitants of the state of Maryland, the bulk of the colonists consists of former slaves who have been manumitted only a short time previous to their emigration from America. The few educated men who have come to this colony are mainly engaged either in the coasting trade or in the management of Government business; and I think it reflects the highest credit on the leading men of this community, that during the twenty-one years from the first settlement down to the present day, not a single shot, nor even angry word, has been exchanged with the surrounding native tribes. This lucky result is doubtless owing, in part, to the restraint put on the traffic in rum. On the whole, I think, brighter days may confidently be looked for. Several missionary societies have established schools in the colony, and are doing their best to enlighten the minds and understandings of the growing generation. There are now four places of worship in the colony: two belonging to the Episcopal Church, one Baptist, and one Methodist chapel. Another church, belonging to the latter congregation, is in course of erection. Of these three different churches the two latter confine themselves to service in the colony; the Episcopal is the only one attending to the conversion of the natives. There are two more stations of this church near Cape Palmas—one at Rocktown, and one at Cavally. The latter is a bishopric.

The total number of inhabitants, exclusive of natives, is at present little more than 1000; the annual immigration amounts to about 60. The farming establishment of the colonists extends 3 miles into the interior in an E.N.E. direction. Last year, the colony declared itself independent, and elected its own governor, who is, however, as formerly, paid by the Colonization Society. Of late, the question of annexation to the Northern Republic has been discussed, but the Liberian government insists upon this colony being annexed as a county, while the public opinion here is in favour of forming a federal state like the American union. As a reason for refusing to join Liberia as a county, it is asserted that the centralized form of government, introduced into the latter by the new constitution, might injure the interests of the Cape Palmas colony.

As to commerce, the exports consist in palm-oil, camwood, and occasionally a little rice (which might be procured in any quantity, being extensively grown by the natives). From October, 1854, to April, 1855, the exports were as follows, according to official returns:—Palm-oil, 35,803¼ gallons; camwood, 19¼ tons; rice, 1177 croos (1 croo = ½ bushel); cash, 7725 dollars. The imports consist chiefly in salt provisions, flour, fancy articles, and the various commodities in demand by the natives. The entire value of imports during the above period has been 29,963 dollars 39 cents; yielding a customs revenue of 2242 dollars 33 cents.

NOTE.—The foregoing communication was written by Ph. Schönlein but a short time before his death, which was announced in a former number of the Proceeedings. The late President of Liberia, J. J. Roberts, has since arrived in this country, and brings the information that the death of this excellent young man was occasioned not by the ordinary fever of the country, but by exposure to the sun whilst engaged in botanical researches. Baron Humboldt, in a letter addressed to Dr. Hodgkin, speaks of him as feeling towards him the affection of a near relation, and asked aid in obtaining information regarding him as the greatest favour which could be rendered to the oldest traveller on the banks of the Oronoco and over the Steppes of Siberia.

2. *The Chinese and their Rebellions, &c.* By T. T. MEADOWS, Esq.,

Chinese Interpreter to Her Majesty's Government in China. 8vo.

IN this analysis the Preface and the chapter—rather a long one—on Civilization, we leave to the consideration of readers who are fond of theorising.

The first chapter furnishes a geographical account of China, showing the important distinction between CHINA PROPER and the far more extensive and comparatively independent countries included under the Empire; giving also an explanation of the military and civil government.

Ch. ii.—The Emperor is absolute, as being the *Teen-tze*, the Son of Heaven, or chosen servant of the Most High; certainly not so *by birth*. The idea of hereditary monarchy existing in China is a fallacy, and when disasters of war, pestilence, and famine, or other unusual evils occur, the Divine commission may be withdrawn, unless the monarch repent him of his evil ways and promptly "return to conformity with Heaven's laws." In fact, "the pure theory of succession is, that the best and wisest man in the empire should be nominated," and the principle of primogeniture seems to be wholly disallowed. "The worthy and talented," the "good and able," were the persons to be chosen for all appointments, high or low. The author insists on the system of examinations for degrees in political science, ethics, history, and law, which, being indispensable in China, he recommends to the notice of the British Government. The Chinese, though autocratically governed, *have always maintained the right of rebellion*, as the only mode of stopping vicious legislation and administration (Ch. iii.). The Mongol, and after them the Manchoo dynasties, have for many centuries oppressed the Chinese and governed the country on principles diametrically opposite to those established by the fundamental principles of the empire. Under their misrule "the sale of government posts was most extensively carried on; and corruption, tyranny, disaffection, robbery, piracy, local insurrections—misgovernment, in short—prevailed up to 1850, when the 'Kwangse rebellion' broke out" (p. 33); which may haply result in the entire emancipation of China from the tyranny of the Manchoos, and the establishment either of Christianity, or the old and long-cherished Con-foot-see faith, *under the dominion* of a native Chinese sovereign.*

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* Huc's work is criticised in Ch. v.

The rebellion was decidedly religious, and there is ground for believing that it derived its origin from Christianity. The originator of the movement was one HUNG-SEW-TSEUEN, a poor peasant of the Hwa district, about 30 miles from Canton, who exhibited such early talent, that his parents gave him an education which enabled him to compete for the degrees at Canton, though without success, owing probably to the greater interest of more wealthy candidates; for every post, degree, or rank, high or low, of late years, went by money in China. The young Luther of China, however, destined to be its Napoleon, was not to be daunted. He met with *Protestant* missionaries, heard certain startling, consolatory truths, and obtained books that wholly altered his character, and prepared him for his grand mission, and appointment by God "to restore the world—that is, China—to the worship of the true God." (p. 81.) His first converts were humble like himself, village schoolmasters; the most important of whom, for future events, was FUNG-YUN-SAN. These two travelled about the mountain provinces, propagating the new faith, and eventually formed congregations, known as the "Society of God-worshippers," which became the strength of the religious-political rebellion that now shakes the imperial throne. (p. 85.)

From 1840 to 1847 this sect remained in comparative obscurity, gradually acquiring Christian knowledge under missionaries from Canton; nor was it till 1850 that the God-worshippers were brought into collision with the local authorities, and forced to a movement of a purely political character. (p. 105.)

Rebellions, however, were no new thing in China. The dynasty of the Mings was overthrown in the seventeenth century not by the Manchoo Tartars, but by a native rebel, one Le-tze-ching. Forty years later, Woo-san-kwei and three other native princes threw off their allegiance from the Manchoos, and were only subdued, after a war of seven years, by the Manchoo Emperor Kang-he. From 1683, also, to the present day, South-eastern China has been the great seat of a formidable political society, best known as the San-ho-whuy, or Triad Society, the express object of which has been the expulsion of the barbarian conquerors of their country. Passive, peaceable opposition to the tyranny of the mandarins, by the way of strikes among the productive and distributive classes, has been of frequent occurrence; and occasionally companies of bandits or rebels openly defied the authorities, pillaged the local custom-houses and treasuries, levying black-mail on the wealthier inhabitants. These, in fact, have become more common in recent years, owing to the growing corruptions and increasing financial difficulties of the state; and in 1849 Mr. Meadows confidently foretold the downward career and fall of the Manchoo dynasty. (p. 122.)

The formal rising of the God-worshippers occurred in Oct. 1850, with the view of finally expelling the Manchoos and establishing the new and native dynasty of *Tae-ping*, or Universal Peace. These religious insurrectionists inspired an alarm far greater than any caused by the Triad Society; and in July, 1851, an imperial army was organised under Shae-hang-ha to oppose the rebel troops, who were gradually advancing northward, joined by two female rebel chiefs, at the head of 4000 followers, and eight chiefs belonging to the Triad Society, who were allowed to join only on condition that they would conform to the worship of the true God. (p. 151.) In the autumn of 1851, the Tae-pings left the Seang district and established themselves in Yung-gan, the capital of which they occupied; then forming an army of 16,000 against 30,000 of the Imperialists, the latter, however, being anything but efficient troops. It was about this time, too, that Hung-sew-tseuen assumed the title of "Heavenly," or "Divine Prince." In the following March the Tae-pings appeared before Nanking, and though a force of 20,000 Manchoos was there to defend that imperial city, they did not strike a blow, and both soldiers and people were indiscriminately massacred. (p. 170.)

Three other large and important cities, also, on the Yang-tse river, were taken and occupied without resistance; and the rebel army now amounted to about 70,090 men.

From the taking of Nanking commences a new era in the history of the Tae-ping rebels; for henceforth, instead of moving from place to place in one united body, they permanently occupy an extensive position in the heart of the country, and send out separate armies in different directions. In May, 1853, a detached army landed on the north side of the Great River, defeated two bodies of Tartars, and took Fung-yang, whence they advanced to Kae-fung, the capital of Honan; but here, as well as at Hwae-king, they were unsuccessful. In the course of the autumn, however, they captured upwards of twenty cities, and advanced so far towards Pekin, as greatly to alarm the court and capital. Loo-chow was taken Jan. 14, 1854; Luh-gan, Feb. 17; and Ling-sing, April 1; thus taking city after city as they progressed northwards. Another army, meanwhile, was despatched up the Great River to Nan-chang, the capital of Keang-se, to which they laid siege in June, 1853, but without success, though detached forces took two other cities to the westward, and pillaged several others. Yo-chow, Chang-ti, and Tao-yuen were taken during the summer; and Woo-chang, the capital of Hoo-pih, surrendered after a siege of 80 days. They shortly after withdrew, but returned in greater force the ensuing year, when they took Han-kow, and again took Woo-chang by storm. Such is a brief sketch of the successes effected by the Tae-pings till the spring of 1855; and now the valley of the Great River has again become the exclusive scene of war, on a much more extensive scale than when they first fought their way through it to Nanking; in fact, hundreds of thousands of men, both in the far-east and the near-east, are engaged in deadly strife for the highest earthly prizes. (p. 189.)

In Chapters xv., xvi., and xvii., are detailed and interesting accounts of the intercourse of the Tae-pings with the Western foreigners, including Mr. Meadows's diary of an excursion on the Grand Canal in quest of information respecting the rebels; the result of the whole being, that while the author condemns all foreign intervention whatever, either for or against the Tae-pings, he considers their establishment in China will contribute essentially to the peaceable extension of free intercourse and commercial privileges; whereas from the present dynasty they can only be obtained by disastrous wars, calculated to engender long national hatred, and to destroy that very industry which alone makes commercial intercourse valuable. (p. 325.)

Chapter xviii. contains a very elaborate account of "the philosophy, morality, and polity of the Chinese, as well as of the religion of the governing class." There are three great prevailing systems of philosophy in China—Taouism, Buddhism, and Confucianism; but the last, more ancient by centuries than either of the others, has always succeeded in maintaining the chief ascendency, and is now deemed the orthodox creed throughout the country. Confucius, or Kung-tsze, however (who was born B.C. 551), was by no means the originator of Chinese learning, for both metaphysical and ethical doctrines can be traced more than 2000 years prior to the Christian era, Fuh-he being considered the founder of Chinese civilization generally. Confucius, indeed, was rather a commentator and expounder of more ancient systems than the founder of a new one; but by him and Mencius, or Mäng-tse (B.C. 317), the whole was amalgamated. After this period the study of philosophy seems to have been almost dormant, till the invention of printing in China (A.D. 932), by causing a circulation of the sacred works, led to a revival of literature and philosophy. Hence we date a second philosophic epoch, commencing with Chow-tze, A.D. 1034, and closing with Choo-tze, who died A.D. 1200; the last of whom is "the fashioner of the Chinese mental life as it now exists, and, in virtue of the vast practical effect of his labours, may fairly claim to be considered one of the greatest men made known to us by history." (p. 335.) His works were historical as well as philosophical; and to this day his views of philosophy, morals, and politics have reigned supreme in China, his works being learned by heart by millions of Chinese, and deemed indispensable at the Public-service Examinations. With the exception, indeed, of the "Complete Philosophy," published, A.D. 1368, by command of the first Ming emperor, and an abridgment of it, entitled the "Essence of Philosophy," in the reign of Kang-he, the second Manchoo sovereign, Choo-tze's are the only works in which the national philosophy is studied. To give the author's exposition of Chinese philosophy, which extends over nearly seventy pages, is obviously quite beside our purpose; but they are well deserving of an attentive perusal by the ethical student.

Mr. Meadows next considers the religious and moral tenets of the Tae-pings, as expounded in their own publications, either founded on the translations of the Bible, as those by Hung-sew-tseuen and his more devout followers, or dwelling on the new alleged revelations from God or Christ, written more recently with a view of furthering the political and military objects of the Tae-pings, by working on men's religious feelings —a class of writings always viewed with dissatisfaction by Hung-sew-tseuen himself. From the former of these it appears that "the Christianity of Hung-sew-tseuen and the more educated of the God-worshippers, is the product of an unassisted study of more or less inaccurate translations of the Bible, by men who had, up to the age of full manhood, devoted themselves to the study of the Chinese Sacred books, and who more or less firmly believed that the fundamental views therein contained, truly pictured the origin and nature of the universe, and constituted the bases of the only true psychology and morality" (p. 413). It is, indeed, an anthropomorphic theism, a belief in God the Father existing at times under a human form, with human attributes, but yet the Almighty, All-wise Creator and sustainer of the universe. All men, they hold, are brothers sprung from a single ancestor produced by or proceeding from the breath of Shang-te or God; and hence is derived the notion that "righteousness is man's inborn original nature." As for the origin of evil, it is ascribed to Yen-lo-wang or "the serpent-devil, the Pluto or king of Hades of popular superstition, and the Tae-pings all bear intense hatred to him and his attendant demons." On the person of Christ their books state, that "the Saviour, the Lord Jesus, is the eldest son of the August, Supreme God," but is only styled Lord, not God; so that they do not hold him as either co-equal or co-eternal with the Father, and hence, of course, the Trinity forms no part of their creed. For further details on the theological tenets of the Tae-pings, the reader must consult the work itself, as well as on the fanatical ideas engrafted on the original creed—ideas which are more akin to Mormonism or Mysticism than pure Christianity; and we now proceed to explain the author's views respecting the prospects of the Tae-pings. "At present," says he, "they have the bulk of the learned against them; but progressive successes will cause the learned to go over to them in increasing numbers, and adopt the new belief; and the end will be that the struggle will commence between the Confucian or rational, and the Buddhistic or fanatical elements of the Tae-ping Christianity; followed by the triumph of the former and the definitive establishment of a sect that will discredit all new revelations, and make the Bible alone the standard of its religious belief." Meanwhile, the political struggle is still doubtful; the Manchoo nation is still powerful, and, by the aid of the Mongols, may perhaps eventually put down the Tae-ping rebels, though neither of the contending parties can even themselves feel assured of success, whatever their language and hopes may be. (p. 463.)

Lastly,—*the question* is canvassed, what is the best policy of the Western *nations towards China, especially* with respect to interference in their intestine *warfare.* "*No nation,*" the author holds, "has the right to aid, by actual force or by intimidation, one of the contending parties in any other nation, unless it be to counterbalance the aid given to an opposite party by a third nation." Now the four most powerful nations in the world are interested in China. England and America have large and increasing commercial interests and missionary enterprises engaged there; France has the same to a less but still increasing extent; and Russia has not only important commercial interests at stake, but has a common boundary with China for thousands of miles, a boundary on which she has shown a determination to encroach. In fact, were Russia allowed to conquer China, she might become the mistress of the world and pursue her conquests into America. That Russia has before made aggressions on the Celestial Empire is matter of history; and as China is herself unable to resist her for the next generation, it becomes the duty of England, France, and America vigilantly to watch the movements of the Muscovite, and enter into a compact to preserve the Chinese Empire from such aggressions, without at the same time interfering in any way with the quarrel between the Manchoos and Tae-pings. The work concludes with some observations on the *morale* of the opium trade, which the author defends, as not more objectionable than many other branches of our commerce with the East.

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3. *Notes on the late Arctic Expeditions.* By Captain SHERARD OSBORN, R.N., F.R.G.S.

Communicated by the SECRETARY.

IT is some years since, on a similar occasion, I was called upon to give my experience of the past, and hopes of the future, to this scientific body. Some of those now present may remember that occasion. I then combated the idea that Franklin's squadron had perished east of Beechey Island, and retreating home from their first winter quarters, and your generous sympathies went with me in my views—that those gallant men were incapable of turning their backs in 1846 upon work they went to execute in 1845. The sequel has shown that we were right, though there were those who looked upon the sanguine as visionaries; and Dr. Rae's evidence proves that some of Franklin's crew only perished in 1850.

Where I was wrong was in heeding that great Arctic bugbear, "the want of traces." It was the absence of these traces for a distance of 100 miles down either side of Peel Channel, searched by Sir James Ross and Lieut. Brown, which made me and others look hopefully to the route that held out the next best hope—*Wellington Channel.*

It is easy now to turn round and condemn those who advocated the search in 1852 up that route. I would remind them that, but for the hopes which lay in that direction, the search would have been abandoned in 1851; and, at any rate, all England can say we never desisted from the search until a clue was discovered. What a source for congratulation it must be to every right-feeling person that we did not, as many suggested years ago, cease our exertions to find them! and is there not something more than remarkable, that, just as a noble squadron has been deserted, and the search likewise, that God should grant a clue to Dr. Rae, which shows us that within an easy sledge journey of the position of either of our ships, the ill-fated 'Erebus' and 'Terror' are probably lying? With respect to our past operations and discoveries of 1852–53 in Wellington and Queen Channel, I would recall to your notice the state of the chart when we left England, to give you an idea of what has been done, and *that* mainly by the zeal and strength of seamen dragging heavy *sledges over the* rough and frozen surface of the Polar Sea. It has not been, *believe me, by sitting* in a boat or sailing in a ship that all those many miles

—more than 2000 geographical—have been added to that chart. It has been alone by dint of sheer strength and perseverance, and long endurance of great miseries, that such work has been accomplished. Many of the poor men will carry to an early grave broken-down health, engendered by exposure and excessive hardship; many of them sunk under it; and I can safely aver that the devotion of our soldiers and sailors before the walls of Sebastopol does not excel that of those poor fellows in their past exertions to rescue Franklin's crews.

You will recollect that, in 1852, the 'Assistance,' 'Resolute,' 'Intrepid,' 'Pioneer,' and 'North Star,' left England to resume the search. I will not detain you with any remarks upon our route to Beechey Island. It is only to novices that that voyage is attended with much that is dangerous and striking. But there is one point upon which I would endeavour to undeceive you. I dare say you all, as well as myself, have heard of coal existing upon the island of Disco as a late discovery. I know it cost us a wild-goose cruise up the Waigat, and the loss of some days' important time. Now, as far back as 1806, Professor Gieseke, a Dane, I presume, discovered this fact; and in an old number of the 'Edinburgh Encyclopædia,' which you will see in a more condensed form under the head 'Greenland,' of a Gazetteer lately published by Messrs. Fullarton, you will get much interesting information of those long-known coal beds, and the geology of that part of the Arctic regions. On the west side of Davis Strait coal is very plentiful, especially about Cumberland Strait, Cape Walsingham, and Home Bay; and, indeed, from thence it extends to the N.W., in a greater or less degree, as far as Banks Land.

On the 13th August, 1852, all our squadron was assembled at Beechey Island. Parties went to research the scene of Franklin's winter quarters; but, as you may fancy, after a couple of hundred seamen had, in 1850, turned everything topsy-turvy, and carried and dropped things far from where they were originally deposited, those who first visited the place in 1852 can have but little idea of what the place was like when we found it as it had been left by the 'Erebus' and 'Terror.' Having completed with more than three years of everything, which would carry us on to 1855, the 'Assistance,' in tow of the 'Pioneer,' started for Wellington Channel. The 'Resolute,' with the 'Intrepid,' had the work of going to Melville Sound, up Barrow Strait. The 'North Star' was our depôt to retreat upon. On the night of August 14th, we, the Wellington Channel division, started. The night was beautifully calm and clear, not a piece of ice to be seen; and you can better fancy than I can describe the excitement of penetrating a hitherto unvisited sea, and seeing unroll before one fresh lands and waters, untrodden and unvisited by man. Next day we commenced to sail instead of steam, and what with landing upon points for observations and angles, our progress was but slow.

As far as Cape Becher, you will remember, parties from the 'Lady Franklin,' in 1851, had repeatedly gone over the land, and particulars of it have been fully and ably detailed by Dr. Sutherland, in his work. The only remark I have to make is, that although right in latitude, we found Penny too far to the westward at Cape Becher—a pardonable error when he had no chronometers supplied, and was not surveyor enough to triangulate his work.

It was not until midnight of the 16th August that we fairly entered Queen Channel. Hitherto we had seen no ice; and as yet a clear sea rolled before us. We could only see about thirty miles more land, which, of course, shortened up considerably the length of that channel. Its direction appeared to be N.N.W. true, and the tide of about three knots force, in the narrow. *Albert Land*, as the N.W. extent of North Devon has been styled, becomes more wild and striking west of Cape Becher, and abounds in magnificent harbours.

The opposite shore, or Bathurst Land, is less picturesque, but contains more animals, and possesses a finer vegetation. The former I may describe as the most barren character, and, for the most part, magnesian limestone; the latter, in places, has a good deal of soil, overlying sandstone and fossiliferous limestone. On the 17th, noon, or rather before it, another landing for angles, observations, and cairn-building took place at Cape Franklin, on the north shore, and, from its summit, I was not a little disappointed to see that the breeze, before which we had been sailing, was blowing upon a tight pack edge, extending right across the channel from shore to shore. Away to the N.W. was one vast body of ice, broken and detached, but without a pool of water amongst it. That night we went into a harbour close to Cape Franklin, and the rest of our sailing adventures in those seas is soon told. At midnight the wind chopped suddenly round to the N.W., and in one hour the winter was upon us. To give you an idea of its suddenness, I had a party on shore, watering the ship by means of a canvas hose, led down a rivulet: the stream froze from the hill top to the sea in the middle watch, and the hose was brought off one solid column of ice as thick as my arm. On the 18th the land was white with snow—the soil was everywhere frozen. The sea, yesterday all blue and sparkling, was covered with one great body of ice, rolling along to the S.E. and down Queen Channel; and prepared as I had been, by experience, for the sudden advent of winter, I had no idea of a change so early, or rapid. Until the 5th October, Sir Edward Belcher, Richards, and myself, continued hard at work, sledging and boating over the surface of a half-cemented sea. The main object I had in view was to see our road for the following spring journeys. In a trip to Table Island and the Wall Cliff, on which occasion Sir Edward Belcher made a flying visit to an extensive land to the north, called North Cornwall, situated in the parallel of 77·30 north, I became fully satisfied that I had been right in the chart published by me in 1852, in leaving Jones Sound open to the west; and when I saw the flood-tide coming from it, and the ice all driving towards it, it required no great brains to see that we were on a sea opening into Baffin Strait.

Sir Edward Belcher's journey in 1853, some fifty miles farther, or beyond the place reached by Captain Richards and myself in 1852, only goes to confirm that hypothesis. The *actual connection* of Jones Sound with the water north of Queen Channel, resting only as yet upon opinion, there is still fifty miles of unknown region intervening.

The winter of 1852-53 was a fearfully severe one. In Banks Land, Melville Sound, as well as with us, temperatures were recorded below 60° of Fah., or 90° below freezing point; and what with us added to its rigour, was the unusual prevalence of cold, piercing mists, occasioned by the rapid tides destroying the ice in our neighbourhood, and the condensation of the warm vapour thrown off from the water. This, together with the total absence of the sun for 106 days, or three months and a half, made it, I should say, one of the most, if not the most, trying winter ever undergone. I shall not detain you farther with these particulars, and proceed to describe the spring operations of 1853.

Captain Richards and I, with a strong division of sledges, were to go westward, whither, of course, it was natural to be supposed Franklin would have gone. So little of the coast was seen beyond Cape Lady Franklin, that no one could tell where it might lead us before we reached Byam Martin Channel, of which, as a communication into the Northern Sea, I had no doubt.

Sir Edward Belcher was, with the ample means which would be at his disposal by the return of some of our sledges, and three of his own particular division, with some picked men, to explore the lands to the N. and N.E. of the ships, reaching Smith Sound, as well as the cairn left by the 'Pioneer' in Jones Sound in 1851, which was about 150 miles from our winter quarters. We, the western division, started to establish a large depôt upon Cape Lady Franklin, on the 22nd of March, 1853—nearly twenty days earlier than travelling had before been attempted. The skill and kind consideration of our gallant leader Captain Richards preserved us, by the aid of a good Providence, from any serious accidents at that inclement season of the year. We returned again, having accomplished that duty most successfully, and were not again allowed to leave until the 10th of April, 1853.

We found the coast-line very tortuous and indented, the weather thick and boisterous, and it was the end of April before we reached Byam Martin Channel. One glimpse of some distant hills, over a frozen sea of ice, showed at once that we were at the head of a strait, in about 107° W., up which Lieutenant Aldrich and Dr. Bradford had travelled in 1837. Now reduced to three sledges we struck across, W.S.W., for the opposite shore.

Several days' dense fogs and strong gales gave us the idea of being altogether adrift; and having erroneously struck off for what sailors call a cape-fly-away, when we joyfully struck the land, Capt. Richards and I now trudged on, the coast trending very precisely alternately N. and S., until on the 17th May the state of our commissariat rendered it necessary to leave him to proceed alone for the remaining 42 days for which he was victualled. We were now, you will observe, 37 days out from our ship, or a distance of about 300 miles, Captain Richards's retreat, as well as his advance, having been secured by the assisting sledges; and he could add to that 300 miles a farther distance of 200, making a total of 500 miles out, or 1000 in all. I was trudging back, when Lieutenant Hamilton, of the 'Resolute,' who came up, *viâ* Hecla and Fury Gulf, overtook me, and from him I learned that the 'Resolute' and 'Intrepid' had, after most strenuous exertions and no small risk, reached Melville Island in 1852. They wintered in Bridport Inlet, ascertained Captain M'Clure's position, and his discovery of the North-West Passage; and, just before he left, the communication with the 'Investigator' had been established, and they might be considered rescued, although M'Clure was still determined and hopeful of accomplishing the whole journey in his own vessel. On the 7th of April the searching parties of the 'Resolute' and 'Intrepid' had started, under Commander M'Clintock and Lieutenant Mecham, to explore W. and N.W., and the route they had taken, in consequence of a pre-arrangement with our division before leaving Beechey Island, entirely clashed with our western work. Rather than come back empty-handed, Captain Richards went on to the 'Resolute,' though, as you may suppose, keeping up an Arctic postal arrangement was hardly worth all the labour and expense of such an expedition as ours had been. I returned to Cape Lady Franklin, sent an officer to Sir E. Belcher, with all the news I had obtained possession of, and then went on working down the west side of Queen Channel.

When I left the ship, this latter part of our work was not contemplated; but Captain Richards and I, on thinking it over, thought it best to provide for the search of so important a strip of coast-line. The ice began to break up just as I reached Cape Lady Franklin—indeed in Queen Channel large patches of water had been seen as early as May 12th. A heavy mahogany gig was, however, available; and, rather than leave the work unfinished, I determined with five men to risk a cruise over the pack. Scurvy had weakened my crew of two. Without tents, or indeed anything but what we stood up in, we started on June 25th from our Cache, and continued leading an amphibious life, alternately upon ice and water, until July 6th, when lack of provisions and the lateness of the season obliged me to turn back. I was then going to the eastward of Dr. Goodsir's position, but not having any chart except my track one with me, did not know how close I was to the limits of MacDougall Bay. Otherwise I might have set another geographical question at rest—although it is my belief that the range of vision down that channel carried me right through and into it.

I came back to find that Captain Richards had arrived at the Cache in safety, and been recalled as well as myself, as the ships were going to Beechey

Island immediately. After a day's chase I caught them, having had the honour at any rate of being the last to leave the search to the N.W. Captain Richards's journey back from Bridport Inlet had been a marvellous one—his average daily journeys had been 15 miles in straight lines, and at a season of the year when the labour of wading through snow water and sludge was excessive. In crossing the head of Byam Martin Channel, his position must have been most trying. The Strait is nearly 36 miles wide at that point, and that covered with melted snow, varying from 1 to 3 feet in depth, a ripple over its surface giving it quite the appearance of open sea, whilst the hummocks, which stood up through it, might be taken for loose driving pack.

It required some confidence and nerve to push on under such circumstances; but foreseeing this, or even an early disruption of the ice, we had taken a boat all the way to Melville Sound; it only weighed 300 lbs. complete, and gave some assurance of safety in case of need.

The chart shows the result of the united labours of our division of sledges.

With respect to what took place to the N.E., I am as ignorant now as the public generally must be. A ravine was found, giving promise to a future traveller of being able to reach the Northern Sea easily out of Alfred Bay in Wellington Channel. Such ravines are common throughout those Arctic lands. Water was seen as early as the 28th May, extending to the N.E. This Sir Edward Belcher, I fancy, believes to be Jones Sound or Strait—it very *probably* is so. Bringing back his boat and a large quantity of provisions, all the N.E. division returned after a 52 days' journey.

North Cornwall had not been revisited by his parties, and I therefore feel myself at liberty to carry its western coast into 100° long., where, from the *Sisters*, I distinctly saw some land bearing N. (true). Of its eastern shore all I could glean was from Dr. Lyall, who went with Sir Edward Belcher to his extreme N., an island then called after the Duke of Buckingham. He confirmed what I had imagined from my view of it in 1852, that it extended away to the N.E. far beyond our ken.

I have now brought up our labours to the commencement of a retrograde movement; and although after that we had many long months of suffering and hard work, it was, I may say, more in connexion with preserving the centralisation of our squadron and certain postal arrangements, than that of the search for Franklin's squadron.

Whilst we completed the work from Queen Channel to Hecla and Fury Gulf, Captain Kellett's crews were working admirably to the W. and N.W. of the last meridian. Commander M'Clintock and Lieutenant Mecham each made enormous journeys of about 1100 or 1200 miles. They explored the shores of two islands, Eglinton and Prince Patrick, the terminal ones of the Parry group, and thus set at rest any questions as to the 'Erebus' or 'Terror' being anywhere upon those shores; whilst upon the western coast, ice of such extraordinary thickness was found as to hold out no prospect of a navigable sea in those latitudes.

In 1852 Captain Kellett's squadron, then falling back with the crew of the 'Investigator' as passengers, was caught by the winter, and spent a season in the pack, driving with it about 80 miles nearer home before it became permanently fixed. In 1853 Captain Kellett, keeping in view the service he went to execute, sent off his available officers and men to leave information for Captain Collinson of Captain M'Clure's safety. That summer, after one of the most rapid sledge journeys upon record, we learned from Lieutenant Mecham the intelligence of Captain Collinson's having, a year after M'Clure, visited Prince of Wales Land, and that he had gone on to the eastward by Dolphin and Union Strait.

Of the rest of our achievements I refrain from speaking, and beg now to *touch upon the results* of our labours, as affecting that science to which this *Society is devoted.*

It will be seen that we, in the first place, have materially altered and rendered more conformable to geographical delineation the outline of Wellington and Queen Channel.

That the coast-line of the Parry group has been by sledges and travellers entirely completed, except in two small spots of 10 miles, viz., between Lieutenant Mecham and Commander M'Clintock's farthest, and Commander Osborn's and Mr. MacDougall's, though both are sufficiently close to leave no room for doubt as to the actual configuration of the land. North Cornwall, as well as many islands, have been added to the chart. The former may be a very extensive continent, and I believe is serving to hold up and to prevent drifting into Queen Channel, or the adjacent waters, that tremendous ice which Captain M'Clure so graphically describes, and so nobly battled with.

The theory of a Polynia has received but little confirmatory testimony from our experience. The water seen by Penny, and by ourselves, was made by the action of strong tides in a narrow channel: wherever the channel expanded, and the tide was consequently weaker, the ice became firm. Our winter in Northumberland Sound was most bitter; and although there were indications of water near us until a late season, that water was evidently occasioned by tides, and not from the sea being of an uncongealable depth.

The animals and birds did not appear to me to consider there was any better region existing to the N. of our position, and in the autumn were as usual seen passing to the S.

As to navigating a Polynia during the winter, as proposed by some visionary or other, I am sure any one who has witnessed the action of frost during an Arctic winter will agree with me that it would be impossible. Such a sea, if one existed, would be covered with one dense mass of vapour like a smoking caldron. In it the mariner would see neither dangers to be avoided, nor heavenly bodies whereby to guide himself. Although the sea might be liquid, yet the air would be so cold that men could not expose themselves to its effects. The rudder would become frozen solid to the vessel; the manipulation of the sails would be impossible, when every rope breaks like a rotten stick; and the blocks would require kettles of hot water to keep them thawed. No steam-engine can work after the water in the ship's bilge commences to freeze, and with us that took place with the thermometer at zero in the open air.

I need not follow that subject farther. Water was seen in the spring in extensive patches off the shore of Albert Land. There is no good authority for believing it otherwise than purely local, caused by the tides being pent up between the islands.

With respect to the geographical features of the northern coast of the Parry group, I would call attention to its uniform but deeply-indented character, from 90° W. long. to 120° W. upon its northern face. A series of long peninsulas jutting generally to the N.W., with narrow seas intervening—these seas being in many places almost joined by contractions or isthmuses of a low character, having on them chains of lakes connected by rivulets. These fiords strongly resemble in character those of Norway, and the south extremity of the American Continent about Cape Horn.

If permitted to theorise, I should say they were occasioned by two great causes—the rush of a water off the land during the summer-thaws, which, during ages, have gradually worked *gullies* into ravines and ravines into fiords; whilst, upon the other hand, the wear and tear of tides and ice have materially aided wherever a rush of fresh water from the land was helping to disintegrate the rock and soil.

I often, when first visiting those regions, wondered at the non-existence of rivers of any great size in those great islands. I witnessed, for nine months in the year, an incessant fall of snow, sleet, and frozen spiculæ, and how the escape of such a vast body of water could take place by a few ravines I could not understand. I fancied, then, the interior must in summer be one extensive lake, and that the water, by its own law of seeking a level, penetrated incessantly through the soil, and reached the ocean eventually. But, now we see the indented outline of those shores, all theorizing is unnecessary. *They serve the purpose of rivers.* Into their ever-frozen bosoms are poured, in the short space of an Arctic summer, the thousands, ay, millions, of pigmy rivulets, which drain either shore of the narrow strips of land.

And, moreover, it will be seen at a glance that the number of square miles of land in any one place is but small. The coast-line bears a very large proportion to the extent of all these islands. Had the Parry group been composed of close-grained granite, or the primary rocks, such as Greenland is, it would have been, like the latter, smothered under one huge glacier long ago, owing to the accumulation of snow, which could in the summer neither scoop out channels for itself nor percolate through its soil. Those islands, however, are formed of limestone and sandstone, both easily acted upon by the agency of frost and water; and on every hand the land bore traces of the extraordinary extent to which Nature applies them in working out her own wonderful and perfect plans.

In the fields of Natural History, we had during our three years' sojourn much to marvel at, and many an old theory to abandon. It is not here that I should touch upon these subjects; but I must tell you that we, with others at Melville Island and Banks Land, were able confidently to state as a fact, though previously unknown, that that Providence which tempers the wind to the shorn lamb, has, in his great wisdom, enabled the deer, the lemming, the musk-ox, hare, and even the ptarmigan, to live through with impunity the rigours of an Arctic winter in the Parry Islands. Turning perfectly white, these creatures pass the winter, seeking their food in its frozen state beneath the snow, which often, and especially in the lemming, hare, and ptarmigan, serves to shield them from the cold, or to secrete them from their foes, the wolf and fox.

Melville Island may be said to abound in game, but on the other islands their visits, like those of angels, are few and far between; and as we come eastward, from the sandstone to the limestone of North Devon, poverty in the vegetable kingdom and scarcity of game are very perceptible.

North of North Devon sandstone again appears, and on Table Island the quantity of vegetation and traces of birds were very striking, although not more than seven miles from the stormy-headed and famine-stricken shore upon which we had wintered. Geologists can best explain why, but at last we all learned to look upon limestone with horror; and the men of my sledge party often said to me, "Ah, Sir, we are coming to that blessed limestone again, and banian days too;" for so surely as we met it, so surely was vegetation scarce, and animals naturally likewise.

ERRATA IN PROCEEDINGS, No. II.

On cover—*Feb.* and *March*, not April.

At page 44, insert—*Eighth Meeting, March* 10. *The Rev. J. S. Brewer,* M.A., *Frederick Manning, A. Roche, Hon. G. Waldegrave, Joshua Walker, and H. J. Williams, Esqrs., were elected Fellows. E. Osborne Smith and T. H. Brooking, Esqrs., on the part of the Council; and H. Raper,* R.N., *and F. Le Breton, Esqrs., on the part of the Society, were elected Auditors for the year.* The Papers read were Nos. 1 and 2, not 5 and 6.

IN PROCEEDINGS, No. III.

Page 55, *Ninth* Meeting, not Eighth; 61, *Tenth* Meeting, not Ninth; 69, *Eleventh* Meeting, not Tenth.—ED.

PRESENTATION

OF THE

ROYAL AWARDS

TO ELISHA KENT KANE, M.D.; TO HEINRICH BARTH, PH.D., AND TO CORPORAL CHURCH, *of the Royal Sappers and Miners.*

His Excellency G. M. Dallas, Minister of the United States of America, having consented to receive the Gold Medal awarded to Dr. Kane, the President addressed him as follows:—

"Sir,—The Founder's Gold Medal, the highest honour this Society has in its power to bestow, has been awarded to Dr. Kane, of the United States of America, for his distinguished services and important discoveries in the Polar regions, while in charge of the expedition fitted out in America to search for Sir John Franklin; and for his valuable Memoir and Charts, communicated through the Admiralty.

"In the absence of Dr. Kane himself, I could desire no greater privilege than that of confiding the award, Dr. Kane has so justly deserved, to the hands of the distinguished representative of the nation to which he belongs; in order that the feeling of this Society, and I may say of the country at large, may go forth in its fullest extent to the land which enrols the name of Dr. Kane among her citizens. Sir, I cannot discharge this duty without passing a remark on the peculiarity of the circumstances attending this occasion.

"It seldom happens that nations so distantly situated, spontaneously unite in such acts of humanity as those which have characterized the late search for Sir J. Franklin. More rarely still do we find the sympathies of individuals so enlisted in the fate of foreigners, as to manifest themselves in acts of philanthropy of such a truly liberal and substantial character as have here occurred; and this act of the United States, together with the names of Grinnell and Peabody, will long be remembered in this country, even after the spirit of Arctic enterprise shall have passed away. But, Sir, if the feelings of *nations* have been deeply enlisted in this search, how much more so must have been the feelings of *individuals*, who enjoyed the friendship of the object of it? Sir, there are persons now present who were early associated with our lamented countryman, who shared with him his first perilous encounter with that icy element which was afterwards to become his tomb, and who enjoyed his friendship through life.

"As one of these, you may imagine that it is with no small degree of interest that I find myself now, in my official capacity, conveying this award of the Society, to the officer who so strenuously endeavoured to determine the fate of him, whom we all so deeply deplore.

"These sympathies, however, have had no share in the decision of the Council. Dr. Kane's merits alone, have won for him this testimony of the Society; and I trust that these reciprocal acts of good feeling between nations and individuals may tend to bind in lasting ties of amity these two great nations, whose sympathies have been shown to be so closely identified."

His Excellency the American Minister, having received the Medal, replied:—

"Mr. President,—On behalf of my fellow-citizen, Dr. Elisha Kent Kane, I receive, with equal pride and pleasure, this testimonial, awarded by your learned body, to his ability and services in that branch of human knowledge, to which you are specially devoted.

"His country also, even now engaged in expressing her high sense of his deserts, will be gratified to learn that her judgment, which might, possibly, be ascribed to partiality, has been thus sanctioned.

"Young as he yet is, and fairly entitled to count upon many years of zealous intellectual activity, he can never achieve a prouder recognition, considered in all its aspects, than this Medal of the Royal Geographical Society of London.

"Dr. Kane, as is personally known to me, entered upon his career of Arctic exploration under the influence of sentiments which were strengthened, rather than shaken, by its depicted terrors. In the medical department of the navy of the United States, on a remote station, his Government scarcely intimated a disposition to join in the search for Sir John Franklin, before he hurried forward to volunteer an enlistment for that noble purpose. There was a voice upon the breeze that had caught his ear; an ardent fondness for scientific studies impelled him to a fresh field of research; a daring and irrepressible spirit of enterprise co-operated with much experience and peculiar attainments. He went—he went twice; and, though he vainly offered his own life to rescue another's, he brought back with him observations, verifications, discoveries, and delineations, worthy to be accepted by the masters of geographical science. If, as I believe was the case, he penetrated to and actually beheld the ice-encircled yet open sea, whose existence had been predicated of the periodical northern flight of aquatic birds, of certain currents, and of other *indicia*, he may justly feel that the practical solution of an interesting problem has earned the honour of your approbation.

"I do not wish, Mr. President, to eulogise my countryman. You are far more competent than myself to appreciate the exact value of what he has effected. Your Council have affixed to his record this their Great Seal; and at your invitation, and with alacrity, I assume the grateful task of transmitting it safely to his hands."

The President then addressed Dr. Barth, who was present, in the following words :—

"Sir,—The Patron's Gold Medal of this Society has been awarded to you 'for your successful and extensive explorations in Central Africa, your numerous excursions about Lake Chád, your discovery of the great river Bínue, and for your hazardous and adventurous journey to and from Timbuctú,' by which you have afforded to us the first really authentic information respecting that important locality.

"In conveying to you this testimony of the high sense entertained by this Society of the merit of your performances, I cannot overlook the important fact that it is just thirty-three years since I found assembled upon the shores of Africa, whence you started, the distinguished but lamented travellers Oudney, Clapperton, Denham, and Tyrwhitt, all bent upon the same great enterprise of opening out the interior of that continent; and although Laing, one of our countrymen, did afterwards succeed in reaching the famed Timbuctú, yet of all this party, and of those who attempted that great exploit, you alone stand upon our shores as the successful accomplisher of the enterprise.

"If, Sir, the service performed be measured by the difficulty of accomplishment, evidenced by the lapse of time and by the loss of life that has occurred in this adventurous attempt, the award of our Medal must be acknowledged to be justly merited. But you have other performances to strengthen your claim; for we are informed that your labours have been so extensive, that the account of them will reach over five volumes of matter, which, collected in such a country, must prove of the highest import.

"Sir, I congratulate you on the successful accomplishment of your undertaking, and trust that this high tribute will stimulate you to future enterprises."

Dr. Barth replied :—

"Mr. President,—It is with great pride and satisfaction that I am here to receive, at your hands, the Medal which the Council of the Royal Geographical Society has awarded to me; for nothing can be more gratifying to a man who, from love of science, has thrown himself into a dangerous and adventurous career, like that of a traveller in the inhospitable and turbulent regions of Central Africa, than the acknowledgment of such a distinguished body of learned and eminent men as the Council of the Royal Geographical Society. But it is not alone on my own behalf that I thank you; as a member of a foreign nation, who will be honoured by the distinction which to-day you have conferred upon me, I offer you also their acknowledgments as well as my own grateful thanks.

"I shall say nothing on the extent and purport of my discoveries, which have been fully appreciated by competent men, and will shortly be laid before the public in a full account of my Travels. *May I only be allowed to* express the hope that, after a great and practicable high road into the heart of Africa has been found at length, with the sacrifice of the lives of so many noble, eminent, and daring men, and after it has been proved to be such by the successful voyage of Mr. Laird's steamer 'Pleiad,' and after a considerable advance has been made in the knowledge of the interior of the continent, which shows it to be of a far richer character than has ever been supposed, Her Majesty's Government will not allow the opportunity to pass by, to establish, in a vigorous manner, legitimate commerce with those unfortunate regions, and thus hold out to the natives a humane and lawful way in which they may be able to supply their wants of foreign produce, without bringing, by slave-hunts and slave-trade, misery and desolation over wide and fertile districts.

"The present moment is the more important for such exertions, as, by the abolition of the slave-trade in the regency of Tripoli and in Fezzan, the trade of the interior has just been brought to a great crisis, and the people are obliged to look most anxiously about for a new channel by which they may supply their wants. The last news received from Dr. Vogel gives a new proof how extremely anxious the chiefs along the river Chadda or Bínue are to enter into friendly relations with the English, but how continually they are disappointed. Certainly the commercial relations of the great western branch of that immense river, the so-called Niger, principally between Timbuctú and Sansandi, are far more developed; but the difficulties which attend the navigation of the lower part of that river, as well between the towns of Bousa and Yauri, as higher up the river between Tosaye and Kendají, are considerable, although with the means which human genius has made available, they appear by no means insurmountable.

"I conclude, Mr. President, by repeating to you my grateful thanks for the distinguished honour conferred upon me this day."

Corporal Church having requested that Lieutenant-General Sir John Burgoyne would kindly do him the honour to receive the award of the Society on his behalf, the President addressed him as follows :—

"Sir John Burgoyne,—The Royal Geographical Society have awarded to Corporal Church this watch and chain, in acknowledgment of his meritorious and intelligent services while employed upon the African expedition under Dr. Vogel. It is the wish of the Society, especially to mark with approbation, his diligence in conducting a long series of meteorological observations at Kuka, and his ability in assisting Dr. Vogel in those observations, by which he has determined astronomically so many positions on his route.

"It will be satisfactory to you, Sir John, to learn that Corporal Church has amply sustained the high reputation of that excellent corps of Sappers and Miners, whose unassuming labours have so materially contributed to render the detail of the topographical survey of this country so perfect, and have so largely contributed towards the suc cess of other geographical undertakings. If anything can enhance the pleasure which I feel in the discharge of this duty, it is that of delivering this acknowledgment of the merits of a zealous and faithful soldier into the hands of so distinguished an ornament of the army, one whose high scientific knowledge and military experience have contributed so largely to the glory of this nation."

Lieutenant-General Sir John Burgoyne, accompanied by Corporal Church, after the delivery of the honorary award, said:—

"Mr. President,—I have not been prepared to take any part in this proceeding; but although unexpectedly called upon, I cannot refrain from expressing the gratification I feel, that any member of the corps to which I have the honour to belong, should be thought worthy of so flattering a mark of distinction as that now conferred. I can assure the Meeting, that the corps of Royal Engineers and Sappers are as ready to devote themselves to scientific enterprise, as they are for military service in the field.

"With regard to Corporal Church, I believe him to be a zealous, good soldier, a man of intelligence, and one who would be always anxious to carry out the orders or wishes of his superiors; and that he would never bring discredit on the marks of favour thus shown to him, by so distinguished a body as the Royal Geographical Society."

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 26th May, 1856,

BY REAR-ADMIRAL F. W. BEECHEY,
V.P.R.S., F.R.A.S., &c.

PRESIDENT.

GENTLEMEN,—Before I address you upon the subject of the progress and condition of that science which we more immediately cultivate, I desire to convey to the Vice-Presidents and Members of the Council for the past year, my acknowledgment of the great assistance I have invariably received from them, especially during a long and serious illness. To them, and to the unremitting attention of our Secretary, is owing entirely the satisfactory conduct of the business of the Society during that period. How well your interests have been attended to, is manifest by the Report of the Council, in which you will find that, whilst the sphere of usefulness of the Society has been enlarged, its permanent fund has been increased, and the list of Members has been extended. You will have learned also that our map-room and library have been enriched by the receipt of the valuable collection of maps and books bequeathed to the Society by Mr. Greenough; to whose memory the Council have directed a marble bust to be executed and placed in a suitable part of the building, as a justly merited testimony of the high regard and respect the Society entertain for this eminent geographer. This extensive collection has been arranged for ready access, and embodied in the general catalogue, under the judicious management of the map-committee and our curator, Mr. Saunders.

You will have been made aware, by the receipt of the '*Proceedings*,' that the Council have carried into effect their determination, conveyed to you at an evening meeting during the session, to issue this publication. They considered that such a work would be acceptable to the Members, and beneficial to the interests of the Society, as a means of conveying early notices of the papers read at the evening meetings, and of the discussions upon them; also as an additional means of readily disseminating geographical information to the Public, who are at liberty to purchase the numbers; and our thanks are due to Mr. Galton, and the Rev. Messrs. Clark and Nicolay, and to our Secretary, for the readiness with which they have undertaken the compilation and editorship. In starting a publication of this description, the Council have been careful to put on record, the restrictions under which this work is to be published, that it may be kept within due control, and strictly confined to the object for which it was intended. I conclude this notice of our household matters with recording the gratifying fact that the obelisk to the gallant Bellot has been erected at Greenwich, and the fund distributed; and thus a great national testimonial has been raised to the memory of that devoted individual, and a benefit bestowed upon his family.

OBITUARY.

It is my painful duty to inform you that, during the past year, the list of Members who have passed away is unusually large. Among them are many names well known to science and to the world at large, of whose merits I can give little more than a very limited sketch.

In alphabetical order I have first to mention,

ADAMSON, John, Esq., one of the earliest Fellows of this Society, and a relative of the celebrated traveller, Sir Robert Ker Porter. Mr. Adamson was the last surviving son of Lieut. Cuthbert Adamson, R.N., who accompanied the Hon. Capt. Phipps, afterwards Lord Mulgrave, in 1773, as 2nd Lieutenant of the 'Racehorse,' in his voyage of discovery towards the North Pole. He was born September 13th, 1787, at Gateshead, and was sent at an early age to Lisbon. From his youth he was devotedly attached to the pursuits of literature, became a member of the Literary and Philosophical Society of Newcastle in 1811, and one of its secretaries in 1825, remaining in office up to the period of his death. Mr. Adamson's brief visit to Portugal in 1803 had left impressions on his mind which were never effaced, and gave him that taste for Portuguese literature which he retained during the remainder of his life. In 1820 appeared the work on which his fame chiefly rests—the Memoirs of the Life and Writings of Camoens, the merits of which have been appreciated at home and abroad. In 1836 he printed for private circulation, under the title of 'Bibliotheca Lusitana,' a catalogue of the books in his library relating to Portugal—an interesting piece of bibliography.

Mr. Adamson's last literary work was a labour of love. He ushered into the world the first five cantos of the 'Lusiad,' translated by his friend Mr. Quillinan, whose lamented death prevented him from completing the task he had imposed upon himself. He was also the editor of several of the publications issued by the Typographical Society of Newcastle. His literary correspondence extends over half a century, and includes letters from geographers, antiquaries, numismatists, naturalists, poets, men of letters and science, and other distinguished persons in various parts of the world. He was a corresponding member of the Royal Society of Northern Antiquaries at Copenhagen, of the Literary Society of Iceland, of the Royal Academy of Inscriptions, Belles Lettres, &c., at Stockholm, of the Royal Society of Literature of Courland, of the Royal Academy of Sciences of Lisbon, of the Archæological Academy of Madrid, a member of the British Association for the Advancement of Science, as well as a Fellow of the Royal Geographical, the Linnean, and the Antiquarian Societies.

BARCLAY, Charles, Esq., F.S.A., formerly of Bury Hill, was the head of the world-known firm of Barclay, Perkins, and Co.

In 1815 Mr. Barclay was elected a member of Parliament for the borough of Southwark. He possessed a liberal and enlightened mind and a benevolent disposition. He was an active and intelligent magistrate for the county of Surrey, and a generous promoter of education. His death was occasioned by a fall from his horse.

BUCKINGHAM, James Silk, Esq., was born near Falmouth, in 1786. In his youth, he passed several years at sea, and also in a variety of occupations on shore; among which, his working as a compositor in printing offices proved of most influence on his career through life. He first became known in public affairs, by his attempts to open up the journalism of India. Mr. Buckingham first went to Calcutta about the year 1815, and always retained much interest in Indian affairs, and hailed with warm satisfaction the removal of the restrictions on the press in India, which the wise and liberal policy of Lords Metcalfe and William Bentinck at length effected. In 1825 he established in London a paper, the 'Oriental Herald,' the precursor of the 'Athenæum,' and of various other journals. On his way to and from India, Mr. Buckingham travelled through different countries, and afterwards published narratives of his travels. In 1822 appeared 'Travels in Palestine;' in 1825, 'Arabia;' in 1827, 'Mesopotamia and adjacent Countries;' and in 1830, 'Assyria and Media.' At a later period, he made tours in various parts of Europe and North America, his account of the latter occupying no fewer than ten volumes, three devoted to the Northern States of the Union, three to the Slave States, three to the Eastern and Western States, and one to Canada, Nova Scotia, and New Brunswick. The European travels are described in two volumes on Belgium, the Rhine, and Switzerland. All these contain much valuable descriptive and statistical matter, the author having paid more attention than is usual with tourists, to the social condition of the countries which he visited. Mr. Buckingham was one of the most pleasing and instructive popular lecturers, especially in describing places which he had visited. In 1832, he was elected M.P. for Sheffield in the first reformed Parliament, and retained his seat till 1837. In his political life, he chiefly took an active part in questions affecting social reforms; and the temperance movement had in him a zealous advocate. In 1849, he published a volume, entitled 'National Evils and Practical Remedies,' in which he expounded his views on a variety of topics of public interest. Mr. Buckingham died on the 30th of June last, aged 69. His last work, published a few months before his death, was his 'Autobiography.'

CARR, Commander Washington, entered the navy in 1811, and in May, 1843, was appointed to the command, in the West Indies, of the 'Hermes' steam-sloop. Commander Carr was known as an amiable man and a sincere friend.

CHATTERTON, Sir William A., Bart., an early Fellow of this Society, died in August last, at Rolls Park, Essex. He was born in 1787, and was the second Baronet, a Deputy-Lieutenant of the county of Cork, a Vice-President of the Royal Literary Fund, a Fellow of the Zoological Society, and a member of the Imperial Academy of Sciences of St. Petersburg.

COLQUHOUN, the Chevalier James de, LL.D., &c., one of the earliest Fellows of this Society, was the only son of Dr. Patrick Colquhoun, late Lord Provost of Glasgow, one of the first who applied himself to the development of the statistics of the British empire. He founded and carried out the present system of Thames Police, whereby the mercantile interest is now so efficiently protected; and suggested in his work on the Metropolitan Police, the adoption of an improved system for the protection of public property and of personal safety, subsequently carried out by the late Sir Robert Peel.

In 1800, he became the private secretary of Mr. Dundas, then the Secretary of State for the War Department; three years later, he received the appointment of Deputy Agent-General for the payment of volunteers. In 1817, the Hanseatic republics constituted him their representative here, and the legislatures of St. Vincent, Dominica, St. Christopher, Tortola, Tobago, Nevis, and the Virgin Islands, at different times nominated him to watch over their interests. In 1827, he was appointed Consul-General of the King of Saxony; and in 1848, his Royal Highness the late Grand Duke of Oldenburg appointed him his Chargé d'Affaires. He was Knight Commander of the first class of the Royal Saxon Order of Civil Merit. On the signature by Reshid Pasha, of a treaty of recognition between the Hanseatic republics, as their Plenipotentiary he received the Order of Iftihar of the first class from the Sultan; and the Hanseatic republics conferred on him the honorary diploma of citizenship, to which the Senate of Lübeck and Hamburg added their honorary medal. The University of Glasgow also conferred on him the honorary degree of LL.D.; and the Royal Antiquarian Society of Athens constituted him an honorary fellow. As Hanseatic Plenipotentiary he signed the commercial treaties with Great Britain, the Ottoman Porte, Mexico, and Liberia; and he also signed a treaty, as Saxon Plenipotentiary, with Mexico. He died on the 23rd of July, 1855, in the 76th year of his age.

ESTCOURT, Major-General J. B. Bucknall, died before Sebastopol last June, of that disease—cholera—which carried off so many of our brave countrymen, in his 53rd year.

General Estcourt, educated at Harrow, entered the army as an ensign, and served in the expedition to the River Euphrates from 1836 to 1837; he went out in 1854 on the staff of Lord Raglan; and served as Adjutant-General of the Forces, from the first landing in the Crimea, sharing the glories and dangers of Alma, Balaclava, and Inkermann. In 1848 he was elected a member of parliament for Devizes.

FRASER, James Baillie, Esq., of Reelick, Inverness, a Deputy-Lieutenant of that county, died in January last, in his seventy-second year. He was born in June, 1783, and was the eldest of four brothers, all remarkable men, sons of the late Edward S. Fraser. James Baillie went early in life to the West Indies; but after a short residence there he resolved, like his brothers, to proceed to the East, whence he returned to this country, about the year 1822. Mr. Fraser again went to India, and was employed in a diplomatic mission, in the course of which he rode on horseback from Constantinople to Ispahán, the fatigues and hardships of which gave the first shock to his vigorous constitution. When the Persian princes visited this country, he was requested by Government to accompany and take charge of them; and on their return, he went with them as far as Constantinople. Latterly, Mr. Fraser became a zealous improver of his Highland estate, which is almost unequalled for its magnificent woods and romantic burn scenery.

In 1820, Mr. Fraser published a 'Tour through the Snowy Range of the Himalaya Mountains;' in 1825, a 'Narrative of a Journey into Khorasan in the Years 1821 and 1822, including an Account of the Countries to the North-East of Persia;' and in 1826, 'Travels and Adventures in the Persian Provinces.' In 1838, appeared his work, 'A Winter Journey from Constantinople to Tehrán, with Travels through various parts of Persia.' He wrote also a History of Persia, contributed various pieces to the Annuals, and ventured once more into the regions of fiction by a Scottish story, 'The Highland Smugglers.' His last work was a military memoir of Colonel Skinner, a distinguished Indian officer, who died at Delhi in 1841, and was buried by the side of his friend William Fraser.

Mr. Fraser was as accomplished as an artist, as he was as an author. He was an exquisite painter in water-colours, and several of his drawings of Eastern scenes have been engraved.

HALL, Dr. George, was well known as an accomplished traveller. Elected, in 1822, a Radcliffe Travelling Fellow of Oxford, he went abroad, and, after visiting the greater part of Europe, joined the Count Alexander de la Borde, who, with his son Count Léon and the Duke de Richelieu, were about to travel in the East. Dr. Hall accompanied that distinguished party throughout the whole of their well-known journey through Egypt and Asia Minor, which gave him opportunities of visiting some parts of those countries then little known.

Whilst at Jericho he made an excursion to the ruins of the cities of Geraza and Amman, in the country E. of the Jordan, of which he printed an account in 1851, for private circulation. It is to be regretted that with the exception of a description of Azani, which appears in Colonel Keppel's 'Journey across the Balkan,' no other portions of his travels have as yet been published.

His varied and extensive knowledge and a most amiable disposition made his society always much sought after, and endeared him to a large circle of friends who will long deplore his loss.

HAMMOND, William, Esq., was elected a Fellow in the year 1838.

HARRIS, Captain Fortescue William, was born in 1821, educated at the Royal Naval School, and afterwards entered the merchant service. After many voyages to China, the East and West Indies, he was appointed to the command of the 'Madagascar' in 1852; went to Calcutta and back, and sailed on the 6th of March, 1853, for Melbourne, Victoria. He left Melbourne homeward-bound on the 12th of August the same year, since which time nothing has been heard of the crew or ship, which is supposed to have foundered while coming round Cape Horn.

IRVING, Edward George, M.D., R.N., was born 1st April, 1816, in the parish of Hoddam, Dumfriesshire, where he commenced his education and continued his studies for several years. He then went to the University of Edinburgh, and remained there until he obtained the degree of M.D. In 1840, he entered her Majesty's navy, and joined H.M.S. 'Britannia.' On the 14th October, 1840, he was appointed to H.M.S. 'Bellerophon,' Captain C. Austen, and was present at the siege of Acre. In August, 1841, he joined H.M.S. 'Isis,' Captain Sir John Marshall, on the Cape of Good Hope station, and remained in her three years. His next appointment was in 1845, to H.M.S. 'Tortoise,' for service on the Island of Ascension. He continued on the African coast until June, 1848, during which time fever prevailed to a great extent, and his own health suffered severely. He remained in England until May, 1850, when he again returned to the West Coast of Africa in H.M. steam-sloop 'Prometheus,' Captain Henry Foote: that officer having been ordered to proceed on a mission to Abbeokuta, Dr. Irving accompanied him thither; and on his return to England, in January, 1853, he wrote an account of their journey, which was published in the 'Church Missionary Intelligencer.'*

The testimony of Captain Foote and Dr. Irving proved that the natives of Abbeokuta and the Yoruba tribe generally, are an enterprising, industrious, and tractable people, and that the effect of missionary labour had been, to turn their thoughts from war and kidnapping to peace and the pursuits of lawful commerce. They had also entered into treaty with the English Government, and friendly relations had been established with the British consuls on the coast, as well as with her Majesty's cruisers engaged in the suppression of the slave trade.

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* *Vide* 'Church Missionary Intelligencer,' June, August, and October, 1853. —ED.

In this state of things the missionaries were the only persons able to give the natives advice upon their political and commercial affairs; yet it was obviously desirable that, as religious teachers, they should be relieved as far as possible from such temporal cares; and for this purpose the Committee of the Church Missionary Society determined to send out a lay agent, who, while on friendly and confidential terms with the missionaries, might also be authorised to communicate with the Consul and naval officers, as well as with the Home Government, upon matters which may tend to promote British interests and commercial relations with the native tribes.

Dr. Irving's experience of nine years upon the West Africa coast, and the interest which he had taken in native civilisation and Christianity, pointed him out as a most eligible person for such an office. It was, therefore, proposed to him to go out for three years on this mission, and he readily acceded to the proposal. The Lords Commissioners of the Admiralty having granted the leave of absence, Lord Clarendon, as her Majesty's Secretary for Foreign Affairs, gave his sanction to the arrangement, and furnished Dr. Irving with letters of introduction to the consuls. Furnished by the Hydrographic Office and by this Society with instruments, with the use of which he had made himself perfectly acquainted, Dr. Irving proceeded to Africa in January, 1854, and diligently improved every opportunity for gaining the confidence of the natives, for promoting internal peace, and for inducing the chiefs to open and protect roads from various towns in the interior, to the coast. His period of labour was very short. He fell a victim to the climate after fifteen months' residence, and his death was deplored by all the native chiefs as a national calamity. His botanical collections have been sent to our learned associate, Sir William Hooker, at Kew.

King, Philip Parker, Rear-Admiral of the Blue, F.R.S.—Admiral King, the son of Philip Gidley King, Esq., Post-Captain in the Royal Navy, was born at Norfolk Island on the 13th of December, 1793, and was consequently in the 63rd year of his age. In early life, when only in his sixteenth year, his gallant conduct in boat actions, had obtained the favourable notice of the officers in command. In later years, he conducted a survey of the coasts of Australia, and subsequently of the southern coasts of America. In February, 1817, h was entrusted with the conduct of an expedition having for it object a survey of the coasts of Australia, a service on which h continued employed in the 'Mermaid,' cutter, and 'Bathurst,' sloo —to the command of which he was promoted by commission, date 17th July, 1821—until his return to England in 1823. The result of the undertaking are contained in a Narrative of the Survey of th Inter-tropical and Western Coasts of Australia, and in an Atlas, bot compiled by Captain King, and published, the former by Murray and the latter by the Hydrographic Office of the Admiralty. I September, 1825, from the feeling of confidence with which he ha impressed the Admiralty, in the discharge of his late duties, he wa appointed to the 'Adventure,' sloop, and ordered to survey th southern coast of America, from the entrance of the Rio de la Plat round to Chiloe, and that of Tierra del Fuego. He was paid off o his arrival in England, 16th November, 1830, and has not been sinc employed. His post commission bears date 25th February, 1830.

In 1832, Captain King published, as the partial fruit of his recen voyage, a volume entitled, 'Sailing Directions to the Coasts o Eastern and Western Patagonia, including the Straits of Magellan and the Sea Coast of Tierra del Fuego.'.

On his retirement from active service, Captain King returned t Australia, and shortly after his arrival, succeeded Sir Edward Parr as manager of the affairs of the Australian Agricultural Society; th duties of which office he discharged with characteristic and exemplary ability and attention for several years. He was appointed nominee member of the Legislative Council by the governor, Si Charles FitzRoy; but latterly he held his seat in the House in th more honourable capacity of a representative member, having, at th general elections of 1851, offered himself as a candidate for the constituency of Gloucester and Macquarie, and on that occasion wa returned by a large majority over his opponent, Mr. Joseph Simmons. During the last session of Council, he strongly supported, i particular, the proposition for the establishment of a nautical school For some time past he held the office of chairman of the Denominational Board of Education, and was consequently regarded as th representative of that body in the Council.

His was the first instance of a native of Australia rising to s distinguished a rank in the British navy, and every one must fee a deep regret that his enjoyment of the honour was for so brief period.

Both in public and in private life, Admiral King merited, as he obtained, the cordial regard and high respect of all to whom he was known, whether personally or by repute.

Lawrence, the Hon. Abbott, who died at the age of 63, was the fifth son of Samuel Lawrence, and was born in Groton, Massachusetts, became a member of the Common Council of Boston in 1831, and in 1834 was elected to Congress, and served the term. He declined a re-election, but consented in 1839 to be a candidate to fill the vacancy caused by the resignation of Richard Fletcher, was elected, and took his seat in the House in December of that year. Upon his entrance into Congress he was put on the Committee of Ways and Means.

Mr. Lawrence, in 1842, was appointed a commissioner on the part of Massachusetts, to arrange the North-Eastern Boundary Question, and rendered most efficient service. In 1849, he was invited by General Taylor to take a seat in his Cabinet. He declined the offer, but accepted the appointment of Minister to Great Britain, the duties of which office he performed honourably to himself, satisfactorily to this, and advantageously to his own country. Mr. Lawrence was public spirited, liberal, charitable, and benevolent. In all schemes of public improvement he took a deep interest, and aided them with his hand and purse. His foundation of the Lawrence Scientific School, at Cambridge, by a gift of 50,000 dollars, and the bequest of an additional 50,000 dollars in his will, his establishing prizes for the deserving scholars of the public schools, and the aid always generously given by him to churches and to religious and charitable associations, are well known.

Loch, James, Esq., died last July at his residence in Albemarle-street, aged 75. He was an Advocate and Barrister-at-Law, and Fellow of the Royal Geographical, Geological, Statistical, and Zoological Societies of London; formerly M.P. for the Kirkwall and Wick district of burghs.

Mr. Loch was the author of a 'Memoir of George Granville, late Duke of Sutherland,' 4to. 1834; and his second son was the late Captain G. G. Loch, R.N., F.R.G.S., Surveyor of the River San Juan de Nicaragua, and author of 'The Closing Events of the Campaign in China,' 1843, 8vo.

Mitchell, Colonel Sir Thomas L., D.C.L., F.R.S., Surveyor-General of New South Wales, and one of the earliest members of this Society, died in October last, aged 63. He joined the army in the Peninsula when only sixteen, served on Wellington's staff to the close of the war, and was subsequently sent back to survey the battle-fields of the Peninsula. His model of the Lower Pyrenees is in the United Service Museum. In 1827, he was sent to survey Eastern Australia, having the appointment of Deputy Surveyor-General. A report of all his surveys is to be published by the Australian Legislature. Sir T. Mitchell made several exploring expeditions into the interior of the country, of which valuable narratives have been published.

In Australia, the name of Sir Thomas Mitchell will be remembered with respect, as one of the earliest and most useful explorers of these rapidly-rising colonies.

MOLESWORTH, the Right Hon. Sir William, Bart., M.P., F.R.S., died in October last, at his residence in Eaton-place, in his forty-sixth year. Sir William was the eighth baronet of Pencarrow, Cornwall, her Majesty's principal Secretary of State for the Colonies, and M.P. for Southwark, a deputy-lieutenant and magistrate of Cornwall, &c.

On his entry into public life, Sir William joined with that section of philosophical Radicals, who were for a period united by subscription to the doctrines of Bentham; he contributed to the 'Westminster Review,' and published at his own cost an elaborate edition of the works of Hobbes. He took office, with a seat in the Cabinet, some three years ago; and, last spring, was raised to that particular office, the Colonial Secretaryship, for which universal consent pronounced him to be so eminently fitted. Sir William, on the recommendation of Sir Roderick Murchison, appointed our Associate, Dr. C. P. Sutherland, who had previously accompanied Captain Penny and Captain Inglefield to the Arctic regions, as Government Geologist and Surveyor at Port Natal, a post for which his abilities eminently qualified him.

NEELD, Joseph, Esq., M.P., F.S.A., F.L.S., died, at his residence in Grosvenor-square, last March, aged 67. Mr. Neeld was a Deputy-Lieutenant of Wiltshire, M.P. for Chippenham, and High Steward of Malmesbury.

OUTRAM, Sir Benjamin Fonseca, M.D., R.N., C.B., F.R.S., also one of the earlier Fellows of this Society, died at Brighton in February last, aged 82. He was the son of Captain W. Outram, was first employed in the medical naval service in 1794, and rose to the rank of surgeon in 1796. He graduated at the University of Edinburgh in 1809, became a licentiate of the College of Physicians in 1810, and was a few years since elected a Fellow. During the long war he was actively engaged in his professional duties, and received a medal and clasps for the actions in the 'Nymphe,' the 'Boadicea,' and the 'Superb.' He was appointed Inspector of Fleets and Hospitals in 1841, and in 1850 nominated a Companion of the Bath and a Knight Bachelor. Sir Benjamin took a lively interest in the pursuits of this Society, and constantly attended its evening meetings. He was a true friend and a kindhearted man, and in his will bequeathed various sums to several charitable institutions.

Parry, Rear-Admiral Sir William Edward, Kt., D.C.L., F.R.S., &c. &c.—It is now my melancholy duty to pay a tribute of respect and regard to our great Arctic navigator, Sir Edward Parry, whose memory will ever be coupled with the records of Arctic adventure of the nineteenth century. Early associated with Sir E. Parry as a messmate, afterwards his first lieutenant during the memorable voyage to Melville Island, and his friend through life, I shall, I am sure, be excused for dwelling on his distinguished career. He was born at Bath in the year 1790, and entered the Royal Navy at the age of twelve, under the patronage of Lord Cornwallis. Zealous in his profession, intelligent and ambitious, Parry soon recommended himself to notice, and in January, 1810, he was promoted to the rank of Lieutenant and appointed to the 'Alexander,' employed in protecting the Spitzbergen whale fishery. It was here that he first became acquainted with that frozen ocean, amidst whose dangers and difficulties he was destined to earn celebrity. Subsequently serving in the 'Hogue,' he assisted in destroying twenty-seven of the enemy's vessels, three of which were heavy privateers. This, and a few skirmishes with the Danish gunboats, are the only actions with the enemy which fell to his lot.

On his return to England in 1817, the extraordinary changes reported to have taken place in the state of the Polar Sea, determined the Government to equip an expedition for Arctic discovery. Then was the turning-point in Parry's life. Like most men of enterprise, he seized the occasion and determined to devote himself to Arctic adventure. There are but few who have not, at some time, the chance of distinction, and Parry took advantage of his. We accordingly find him in command of the 'Alexander,' and, under the orders of Sir John Ross, leaving England in quest of the North-West Passage, by way of Davis Strait; the result of this expedition, it is well known, was the restoration to our map of the outline of Baffin Bay, and the re-discovery of the famed Lancaster Sound.

Dissatisfied, however, with the account which had been given of the result of this voyage, and anxious to remove an erroneous impression conveyed by Sir John Ross on the subject of Lancaster Sound, he made such representations to the Admiralty as induced Government to send another expedition to the same place. Of this expedition Sir E. Parry was appointed chief. During the voyage, an opportunity occurred for displaying that vigour and determination in overcoming difficulties, which, though they might daunt the generality of men, were unable to turn him from his purpose. In the upper part of Baffin Bay there presented itself what appeared to be an impenetrable barrier of ice; undismayed by the dangers that threatened, he dashed into the midst of it, accomplished his purpose, and entering Lancaster Sound in safety, succeeded in passing over that imaginary chain of mountains with which Ross had closed the strait.

The demolition of these phantom mountains, and the discovery of the opening into the Polar Sea on the west, of Prince Regent Inlet on the south, and of Wellington Channel on the north, together with Parry Islands (the Ultima Thule of Arctic discovery) and Banks Land, the terminating points of Sir E. Parry's and Sir R. M'Clure's explorations from opposite directions, were the consequences of the first summer of this expedition. Having passed the meridian 110° W., the Commander and his associates became entitled to the award of 5000*l.* offered by Government for the encouragement of Arctic enterprise. The winter they were destined to pass in this dreary region afforded another opportunity for Parry to display those qualities which so eminently fitted him for the work he had selected, since, by his admirable arrangements for the health, comfort, and amusement of his men, he was enabled to keep the crews in vigour, mental and bodily, while, by the vast number of observations he carried on, he determined his geographical position with a precision worthy of a better object.

In the following spring, by an overland journey, he discovered Liddon Gulf, where his broken cart remained to be seen by M'Clintock, thirty years afterwards. Finding any farther advance with his ship impossible, he determined in the latter part of the summer of 1820 to return to England, where he arrived in safety, and received, on all sides, a most enthusiastic greeting. He had but little rest, however, for in the May following he was again appointed to command another expedition, which was to proceed by way of Hudson Strait and Sir T. Rowe's Welcome. Although this voyage, like the *last, failed in its* main object, much valuable geographical knowledge resulted from it, and considerable information as to the Esquimaux tribes of that region was obtained. On returning to England Parry was promoted to the rank of Captain, and in another year found himself once more on his way to the frozen North, in order, if possible, to co-operate with an overland expedition under Franklin. This was the last of Parry's North-Western voyages. The subject of our memoir was now confirmed in the office of Hydrographer to the Admiralty, which had before been temporarily held by him; still, however, directing his attention to Arctic research, he offered to carry out a scheme, which had been proposed in 1818 by Franklin and myself: namely, to attempt reaching a high northern latitude by travelling over the Spitzbergen ice. He accordingly sailed in 1827 for Hammerfest, and doubtless would have succeeded in his object, but that an unexpected impediment presented itself; for the ice over which he travelled was found to move southward at almost the same rate he advanced northward, and he was most unwillingly compelled to retrace his journey, having proceeded to 82° 45′ N. lat.—farther towards the Pole than any of his predecessors.

In 1829, Parry was appointed Commissioner for the management of the affairs of the Australian Agricultural Company, and, in pursuance of the duties of the office, took up his residence at Port Stephen, 60 miles to the north of Sydney. Before leaving England, he received the order of knighthood, and was created D.C.L. of Oxford.

Returning once more to England, after an absence of five years, he was made Poor Law Commissioner in the county of Norfolk, but did not long hold an appointment which was uncongenial to his tastes. Soon after this, Sir E. Parry was selected to organize and conduct a newly-created department of the Admiralty, under the title of Comptroller of Steam Machinery, and it was during the time that he remained in this office, that the screw-propeller, now indispensable to our fleets, was introduced into the navy.

In 1847, in consequence of failing health from over-work, he resigned this also, and became Captain-Superintendent of Haslar Hospital; and, in 1853, the Lieutenant-Governorship of Greenwich Hospital falling vacant, he accepted it.

Disease, however, had begun its ravages, and, under the direction of his medical advisers, he determined to try the waters of Ems. On his way to these baths he was detained by exhaustion at Coblentz, and only reached Ems to die.

Thus ended the career of one of the most distinguished officers of his age, who had spent his days in active usefulness, and whose life was remarkable not only for its varied character, but also for the genuine and unaffected piety which pervaded it.

Among the works which Sir E. Parry left behind him, we may enumerate a small volume on 'Astronomy by Night,' another on the 'Parental Character of God,' and an 'Address to the Sailor,' besides the narrative of his voyages, which, in value, compete almost with those of Cook. We find him also associated with three papers in the Transactions of the Royal Society.

PHILLIMORE, Joseph, Esq., D.C.L., was the eldest son of the Rev. Joseph Phillimore. He graduated in Civil Law, becoming B.C.L. in 1800, and D.C.L. in 1804. He had been distinguished for his scholarship, and especially for the talent for composition which he displayed, as well at Westminster, as after his removal to Christ Church, where he gained the College prize for Latin verse. In 1798 he obtained also the University prize, which was adjudged to his English essay on 'Chivalry.' After some residence in foreign parts, he settled in London, and was admitted an advocate in Doctors' Commons 1804. On the death of Dr. Lawrence, in 1809, he was nominated judge of the Cinque Ports by Lord Hawkesbury; Chancellor of the Diocese of Oxford by Bishop Moss; and Regius Professor of Civil Law at Oxford—an office upon the reputation of which his classical taste and language have shed additional lustre.

On the installation of the Marquis Camden as Chancellor of the University of Cambridge in 1834, Dr. Phillimore was invited to Cambridge, to receive an honorary degree from the sister University.

PUSEY, Philip, Esq., D.C.L., F.R.S., of Pusey Park, Berkshire, died July last, at his brother's residence in Christ Church, Oxford, aged 56. He succeeded to the family estates on the death of his father in 1828, and entered parliament in 1830, as one of the members for Chippenham.

As a practical agriculturist, Mr. Pusey was highly distinguished. He was the President of the Royal Agricultural Society in 1853, and he edited and largely contributed to the Journal of that Society. He was universally beloved, for there was a natural frankness and warm-heartedness with him, that developed themselves in every relation of life; and among his tenantry it was impossible for any one to be more highly esteemed.

SANTAREM, le Vicomte de, Manoel Francisco de Barros e Sousa da Mosquita de Macedo, Leitao e Carvalhaza, Corresponding member of this Society.

This learned Portuguese, born at Lisbon in 1792, was a member of one of the most ancient and illustrious families of Portugal. After having received an excellent education, he was sent as minister of Portugal to the Court of Denmark; recalled after the revolution of 1820, he was appointed, in 1823, keeper of the archives of the realm, having already, in 1821, during a sojourn in Paris, collected numerous documents bearing upon the history of Portugal from among the MSS. in the 'Bibliothèque Royale.' In 1827, he was appointed Minister of Foreign Affairs, but shortly afterwards, upon his retirement, he proceeded to Paris, where he joined the Geographical Society in 1835, and was afterwards elected Vice-President. The library of our Society is enriched with numerous works from his pen; and it was but last year that my predecessor in this chair directed the attention of the world to his beautiful work on the 'Discoveries of the Portuguese,' and other labours, which have been so suddenly interrupted by his death, which took place in February, 1856.

Symonds, Rear-Admiral Sir William, K.H., C.B., F.R.S.—late Surveyor of the Navy—died in March, on his voyage from Malta to Marseilles, aged 74. Sir William entered the navy at an early age, and, during the early part of his career, was much engaged in active service on the coasts of France, Spain, and in the West Indies. He obtained post rank in 1827; and in 1831, Capt. Symonds was enabled, through the munificence of the Duke of Portland, to build the 10-gun brig 'Pantaloon,' the triumph of which vessel led to the construction, under his superintendence, of the 'Vernon,' 50; 'Vestal,' 26; 'Snake,' 16, and others. On June 9th, 1832, he was offered, and accepted, the appointment of Surveyor of the Navy, which he continued to fill until 1847.

Sir William Symonds received the honour of knighthood for his services, and the thanks of the Admiralty in 1830 for a memoir containing 'Sailing Directions for the Adriatic Sea;' and again, in 1837, for "the valuable qualities of his several ships, and for improvements introduced by him into the navy." He was elected a F.R.S., 1835, and nominated a C.B. on the Civil division, 1848. In 1854 he became a Rear-Admiral on the retired list.

Urcullu, Don José de, was born in Hamburg on the 8th April, 1787. His father, D. Manuel de Urcullu, the Spanish Consul in that city, brought him, at an early age, to Bilboa, where he had possessions. On the death of his father, he was sent to be educated to the college of São José de Calasan, in Saragossa, *where he graduated in the faculty* of Philosophy. In 1807, having completed his studies, and being then little more than 20 years of age, he entered the regiment of Saragossa, and was made prisoner by the French in 1808. He continued in the military profession till the year 1820, when he left it, having attained the rank of Captain, and dedicated himself, with all the ardour of a studious mind and a lively imagination, to the pursuit of literature; writing and translating various works in prose and verse. These works gained for him the distinction of being nominated a Corresponding member of this Society; of the Geographical Society of Paris; and of Rio Janeiro. In the year 1822, when secretary to the Captain-General, he married the eldest daughter of Mr. Richard Allen, the English Consul at Corunna; and the Consul dying soon after, he proceeded with his wife and family to establish himself in the city of Oporto, but was obliged to emigrate to England in the following year in consequence of political disturbances. He returned to Oporto in 1827, and was appointed manager of the Fiscal Department of the Royal Tobacco Contract, and subsequently Administrator of the Commercial Press of Oporto. In the same year he was appointed Consul of the Republic of Peru at Oporto. In 1847 he returned to Oporto from Puerto de Sta. Maria; and in 1850, at the request of a private friend, resident in Bilboa, he went to that city to open and direct a college for superior education, which undertaking he carried out with the most praiseworthy success. Finding, however, himself in ill health, he returned in 1851 to the bosom of his family, and, after long and severe suffering, he died, much lamented by his relatives and friends, by whom he had been always esteemed for his many virtues and high character. He was buried in the cemetery of Nostra Señhora da Lapa, in the city of Oporto.

WHARNCLIFFE, John Stuart, Lord, F.R.S., second Baron Wharncliffe of Wortley, county of York, died in October last, at his residence, Wortley, Sheffield, at the age of 54.

His Lordship was greatly attached to agriculture, seeking all the newest modes to improve the culture of the land. He addressed a letter to Philip Pusey, Esq., on Drainage, published in the Journal of the Royal Agricultural Society.

WIDDRINGTON, Captain Samuel E., R.N., F.R.S., died January last, at his residence, Newton Hall, near Felton, Northumberland. He was the eldest son of the Rev. Joseph Cook, M.A., of Newton. In October, 1829, Captain Cook went to Spain, and having subsequently resided for three years in that country, he published, in 1834, in two volumes octavo, 'Sketches in Spain during the years 1829-30-31 and 32, containing Notices of some Districts very little known; of the Manners of the People, Government, recent Changes, Commerce, Fine Arts, and Natural History.' This work, which was dedicated to Lord Prudhoe (afterwards Duke of Northumberland), was the most complete account in our language.

In 1843 (having then assumed the name of Widdrington) he repaired to Spain again, and, in the following year, published another book, entitled 'Spain and the Spaniards in 1843,' in 2 vols.; also dedicated to the Duke of Northumberland.

Captain Widdrington was a magistrate and deputy-lieutenant of Northumberland.

Wielhorski, the Count de, who died in the Crimea, whither he had been despatched by the Empress of Russia upon a charitable mission of relief to the sick and wounded of the Russian army. This amiable young nobleman was well known to this Society in connection with his kind services in procuring the necessary letters of introduction to the governors of Russian America for various Arctic commanders, as well as for his presentation to our library of the 'Agricultural and Statistical Atlas of European Russia,' with a translation into good English, made by himself at the request of our Secretary.

Yates, Joseph Brook, Esq., F.S.A., the last name on our list, and one of the earlier Fellows of this Society, died in December last at Liverpool, aged 75.

Mr. Yates was educated at Eton, and subsequently became actively engaged in commercial pursuits, which however in no wise diminished his taste for literary and scientific subjects. In 1812, he and Dr. Traill, now of Edinburgh, mainly contributed to the foundation of the Literary and Philosophical Society of Liverpool.

In 1839, Mr. Yates drew attention to a subject of great local importance—the rapid changes which take place in the mouth of the Mersey; and noticed the possible difficulties which might hereafter be experienced in the commerce of the port. These had attracted the attention of the marine surveyor and of many ordinary observers, but it was not easy to discover a cure for an admitted evil. At the meeting of the British Association at Liverpool in 1854, Mr. Yates, in a paper read before the Geographical section, again directed attention to the subject, and a committee was appointed to inquire into the whole matter, which has held its sittings in the house of the Royal Geographical Society, and which is still pursuing its labours.

In the pursuits of geographers and travellers he took a deep interest, and he possessed some curious mediæval maps and charts.

In February, 1838, he read a paper on the State of Geographical Knowledge and the Construction of Maps in the Dark Ages, with an account of their revival in the sixteenth century. He was a Fellow of this, of the Antiquarian, and of several other learned Societies.

GEOGRAPHICAL PROGRESS.

The great military events in which the country has been engaged during the past year, and the objects to which the energies of the nation have necessarily been directed, may naturally be supposed to have diverted attention from those pursuits of science which are not of a military character. Although this may be true in some respects, yet much has been accomplished in the branch of science which we cultivate, and but few of the meetings of the Society have passed without some addition to our store of geographical knowledge.

EUROPE.

Great Britain—Ordnance Survey.—The present year will be marked as a great epoch in the history of the geography of our own country. The Trigonometrical Survey, which commenced, in 1784, under General Roy, R.E., has just been brought to a close under Lieut.-Colonel James, R.E., the present zealous superintendent of the Ordnance Survey. The principal object which the Government had in view when the Trigonometrical Survey was commenced, was the determination of the difference of longitude between the observatories of Greenwich and Paris; and for this purpose a base line was measured on Hounslow Heath, from which a series of triangles, including the Observatory of Greenwich as one of the points, was carried to Dover and the opposite coast of France. The French geometricians at the same time extended their operations also to the coast, and the connection between the triangulations of the two kingdoms was made by conjoint simultaneous observations.

This chain of triangles from Hounslow to Dover was then made the basis of the Topographical Survey, which was also in progress at that time under the Master-General of the Ordnance; and from Hounslow as a starting point, the triangulation has been carried over the whole extent of the United Kingdom. Lieut.-Colonel James has recently communicated to the Royal Society the principal results of the Trigonometrical Survey, in a paper 'on the Figure, Dimensions, and Mean Density of the Earth, as derived from the Ordnance Survey.' In this communication, he states that now that the observed angles have been corrected by the most refined methods of mathematical science, the triangulation is rendered perfectly symmetrical and consistent in itself, so that, any side being taken as a base, the same length will be reproduced when it is calculated through the whole or any part of the triangulation. This, as regards the angular measurements, leaves nothing to be desired; and when the five measured bases are incorporated in the triangulation, although some of them are 400 miles apart, and from 5 to 7 miles in length, the greatest difference between the measured and computed lengths of the bases does not amount to 3 inches; and it may be safely affirmed that such a degree of accuracy was never before attained in so extensive a triangulation.

Astronomical observations have been taken at numerous trigonometrical stations for the purposes of determining their latitudes, and by comparing the amplitudes of the astronomical with the geodetical arcs, the figure and dimensions of the Earth have been determined. In determining the most probable spheroid from all the observed amplitudes, continues this talented officer, it was evident that the plumb-line was deflected from the true direction of the zenith at several points, and that this was the case at the Royal Observatory of Edinburgh and Arthur's Seat near it, to the extent of 27" to the south. The configuration of the ground—the great valley of the Frith of Forth being on the north, and the range of the Pentland Hills on the south—presented a tangible cause for the deflection; but as the contoured plans of this district were published, and Colonel James was himself personally acquainted with the geological structure of the country, he had observations made on the summit and on the north and south flanks of Arthur's Seat, with the view of determining the amount of the attraction of its mass, and from thence deducing the mean specific gravity of the Earth. The computed deflection of the plumb-line due to the configuration of the ground, accounted in great measure for the observed anomaly in the amplitudes of the arcs of the meridian. The longest arc of meridian which has been computed in Great Britain, extends from Dunnose in the Isle of Wight, to Saxaford in the Shetland Islands, and is 10° in length. The Polar diameter of the Earth, as determined by the Ordnance Survey = 7,900 miles; the Equatorial = 7,926; the compression = $\frac{1}{299{\cdot}33}$; the mean density = 5·316.

These great geodetical operations have now been brought to a close, and a full detailed account of them is in the press, and will be shortly published. The latitudes and longitudes are now being engraved on the marginal lines of all the first published sheets of the Survey of Great Britain. The progress of the detailed Survey of Scotland and the northern counties of England has frequently been brought to the notice of this Society, and much dissatisfaction has been expressed at the slow progress which has been made. Since 1851, when the Committee of the House of Commons, of which Lord Elcho was chairman, reported upon the subject, the question as to the scale upon which the MS. plans should be drawn may be said to have been under constant discussion; and for two years of this period, the officers engaged in the survey, in consequence of the frequent change of orders and the long period during which they were without any orders whatever, made scarcely any progress at all. Another Committee of the House of Commons has recently reported upon the subject. They had before them, the written opinions of the most able professional and scientific men in the kingdom; and, continues Col. James, it is to be hoped that the recommendations of that Committee will now be finally adopted for the future guidance of the officers on the survey. They are, as nearly as possible, having reference to the difference in the standards of measure in the two countries, conformable to the instructions for the survey of France, viz.—

1. For the *cultivated districts* the original plans are to be drawn on the scale of $\frac{1}{2500}$ of the linear measure of the ground, or 25·334 inches to a mile, which is sensibly the same as one square inch to one acre.

2. The *uncultivated districts* are to be drawn on the scale of 6 inches to a mile, and the 25-inch plans are also to be reduced to this scale, previous to the whole being reduced to the scale of one inch to a mile, to complete the general map of the kingdom on that scale.* The object which the Government now has in view is, to make the National Survey the basis for the valuation and registration of the sales of property, to facilitate the transfer of property, and for all general or local engineering purposes, including the Hydrographical and Geological Surveys, and every purpose for which an accurate, authentic plan or map is required. This gives an importance to the survey which it never before possessed; and with the ample funds which the Government appear disposed to grant, it is expected that

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* An arrangement which will, I am sure, be gratifying to our excellent *ci-devant* President, Sir R. Murchison, who so strenuously advocated it in his last Address to this Society.—*See* Vol. XXIII.

the whole of Scotland will be finished, as well as the north of England, within ten years.

The system of registering the levels by means of horizontal contours, has been for some time generally adopted on the Ordnance Survey, and their great value is now very generally acknowledged. The contours, when reduced to the one-inch scale, form the most perfect basis for the hill-sketching; and the plans now produced are the most perfect in all respects which were ever made. In England, the counties of Lancaster, York, and Durham have been surveyed for the large scales. In Scotland, the shires of Wigton, Kirkcudbright, Edinburgh, Haddington, Linlithgow, Fife, Kinross, Ayr, Dumfries, Peebles, with the Isle of Lewis, have been surveyed. Eight of the above counties have already been published, and the remainder are in course of publication, whilst the survey is now proceeding in Berwick, Lanark, Roxburgh, and Selkirk-shires.

The one-inch general Map proceeds *pari passu* with the surveys on the larger scales.

The whole of Ireland has been published on the 6-inch scale, and the 1-inch map is rapidly progressing, and several of the sheets are published.

While the subject of our Trigonometrical Surveys is under consideration, I may mention, on the authority of Col. James, that the Surveys of our Colonies are proceeding in the following places, under officers of the Royal Engineers, having, in most places, men of the Royal Sappers and Miners under them:—Australia, Tasmania, Ceylon, Mauritius.

Admiralty Surveys.—To a maritime nation like Great Britain, the importance of detailed nautical charts, with ample sailing directions for the guidance of the mariner, is too obvious to render any excuse necessary for entering with some minuteness into the state of the survey of our own shores. A rapid reconnaissance of a coast might have been tolerated half a century ago; but such a survey of any shore, much less of our own shores, cannot now be accepted. The Ordnance large-scale survey, with its almost mathematical exactness (within certain limits), and the labours of the civil engineer, with his accurate lines of levels extending across the island from sea to sea, have shown us that greater accuracy in our coast surveys has become requisite. Hence the necessity, among other considerations, of determining the tide levels with the greatest care in our estuaries and rivers. This has lately been done by Commander Alldridge, whom I have the pleasure to acknowledge as a pupil of my own, in the river Dee, and in other places; by Mr. E. K. Calver in the Orwell and Tyne; and by Captain Williams in the Fal; while at the same time the progress of the tide wave, marked by the successive times of high water, has been carefully recorded, and the results have been of much assistance to the civil engineer.

England.—I learn from our able and zealous hydrographer, Capt. Washington, R.N., that on the south of England, Lieutenant Cox and Mr. Usborne have mapped the coast from the Bill of Portland westward to Golden Head, including the remarkable shingle beaches of Abbotsbury and the Chesil Bank, and have made a detailed plan of the harbour of Bridport. They have now begun a careful examination of Plymouth Sound, the result of which must be looked forward to with much interest, as it will show what effect the breakwater has had upon that anchorage, during the forty years that have elapsed since the stone of that structure first raised its head above the level of low water.

In Cornwall, Captain G. Williams and Mr. Wells have completed the thirty miles of coast between Fowey and Falmouth, with plans on a large scale of the harbours of Pentuan and Mevagissey, the latter so valuable to our pilchard fishery.

In the Bristol Channel, Commander Alldridge and Mr. D. Hall have produced an excellent plan of the rivers Taw and Torridge, leading up to Barnstaple and Bideford on the north coast of Devon. Their last year's work, namely, the plans of Milford Haven, with Pembroke Reach, on the scales, respectively, of 4 inches and 12 inches to a mile, have been published at the Admiralty.

Farther north the channels and shoals at the entrance of the Solway Firth have been re-examined, and the charts have been corrected for the material changes, which have occurred during the last twenty years, since this Firth was originally surveyed.

A new edition of Part I. of the Channel Pilot, comprising the entrance of the Channel and the coast of England as far as the Downs, has been compiled by Mr. J. W. King, Master R.N., and published at the Admiralty. Part II., which will contain the north coast of France, from Grisnez to Ushant, is well advanced.

Scotland.—The remarkably broken outline and indented shores of the Western Highlands of Scotland, embracing picturesque fiords and lochs, afford constant occupation for a large force of surveyors. Commanders Bedford and Creyke are employed in Argyllshire; and parts of Jura, of Loch Spelve in Mull, and Loch Feochan, have been mapped during the past season.

More to the north Commander Wood, and Messrs. Jeffery and Taylor, are engaged on the shores of Skye, and have recently examined its northern coast from Loch Sligachan to Kyle Akin and Kyle Rhea. The nautical survey of these coasts, however, can only proceed slowly, as the coast surveyors have to do not alone their own legitimate work, but that of the Ordnance also, as the land survey has not yet reached the Western Highlands and islands of Scotland.

With the exception of part of the isle of Lewis, the Hebrides are yet unsurveyed; but a strong force, under Captain Otter, has again broken ground there, and there is reason to believe that this outlying portion of the realm of Scotland will not much longer remain the opprobrium of our maps and charts.

The Orkneys and Shetland have been revisited, during the past summer, by Mr. E. K. Calver, in order to revise and prepare for immediate publication the sailing directions of those intricate groups. This work has been very satisfactorily executed, and the Directions are now passing through the press.

In the Firth of Forth, Lieutenant Thomas and his assistants have examined the coast of Fife as far as Fifeness; they have filled in the deep-water soundings to the eastward of the isle of May; and if the season prove favourable, they will this year complete the survey of the Firth of Forth as far as St. Abb's Head, its natural southern limit.

Ireland.—Captain Washington, continuing his report, observes, in the county of Antrim, on the north-eastern shore of Ireland, Messrs. Hoskyn, Aird, and Yule have mapped the coast from Carrick-a-Rede southwards to Garron Point, a distance of about 40 miles; they have also connected by soundings Rathlin Island with the Main. The same party is now employed in recording the remarkable improvements that public spirit and good engineering have within the last few years effected in the harbour of Belfast.

On the coast of Donegal Captain Bedford and Lieutenant Horner have completed an elaborate and admirable plan of Lough Swilly, which shows all the striking features of that fine inlet of the sea, which has often proved a harbour of refuge to the toil-worn mariner in the hour of need.

On the south-west coast of Ireland, in the county of Kerry, Commanders Beechey and Edye, with Mr. W. B. Calver, have made a beautiful plan of Castlemaine harbour and bay, and are now advancing along the northern shore of the peninsula which forms the southern limit of Tralee Bay.

A little farther to the southward, on the same coast, Commander Church and Lieutenant Veitch have mapped the shore of Kerry, from Ballinskelligs Bay to Port Magee, and for the first time laid down correctly and given us the soundings around those striking schistose rocks, the Skelligs, which rise, almost precipitously, to a height of 700 feet above the level of the water, and on which bursts the whole force of the Atlantic ocean swell. This was a labour of no common kind, and required for its accomplishment a combination of skill, seamanship, and persevering energy that falls to the lot of few.*

Baltic.—A time of warfare, at first sight, would not seem favourable to the advancement of hydrographical knowledge, or at least to the more peaceful branches of science, yet, observes Captain Washington, we are enabled to state that at the close of the struggle now happily terminated our acquaintance with the Baltic, and the Gulfs of Finland and Bothnia, is considerably in advance of what it was when the campaign opened; but it is to the Danish, Swedish, and Russian charts of those seas that we owe the fact of our ships being enabled to pass the Kattegat, the Belts, and the Sound without hesitation, and to navigate the inner gulfs of the Baltic without danger. Notwithstanding all the vague assertions to the contrary, it does not admit of a question, that no fleet ever left the shores of Great Britain so well provided with charts as the Baltic fleet. It is but an act of justice to the eminent hydrographers of Denmark, Sweden, Norway, and Russia (with whose charts the fleet was furnished), that their fame should be vindicated. The names of Zahrtmann, Klint, Vibe, and Lütke are of European reputation, and afford ample guarantee for the accuracy of the charts published under their superintendence. That opportunities have since been afforded for making additions to them is only what might have been expected. A fleet numbering occasionally 100 sail could not be cruising for two summers in a narrow sea without taking soundings; and it is highly to the credit of the masters of that fleet generally that they availed themselves of every occasion of adding to the charts all the information they obtained. Our special surveyors, Captains Sulivan and Otter, and their assistants, Commanders Cudlip, Creyke, and Burstal, and Lieutenant Ward, R.N., were enabled to make plans of Led Sound in the Åland Isles, and the approaches to Bomarsund; of Barö and Häst Sounds, with the southern access to Sweaborg; of Wormsö Sound on the south side of the Gulf of Finland, with various tracks as far as Torneå and Haparanda, at the head of the Gulf of Bothnia.

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* It is with extreme regret that I have to add that this was the last labour of Commander Church. On his way to Ireland, after depositing his charts at the Admiralty, he was suddenly taken ill at Bristol, and in three days was no more. His worn-out frame, which had toiled for many years under an African sun, and had bravely buffeted with the Atlantic surge while mapping the coasts of Cork and Kerry, sunk under the attack, and thus deprived H.M. service of one of the best of its surveyors. Skilful, energetic, zealous, of unbending integrity, and a thorough seaman, he combined all the qualities of an accomplished surveyor; and so long as the Fastnet Rock and Cape Clear continue to be the landfall of vessels crossing the Atlantic from America, the mariner will have cause to bless the skilful hand that, by accurately defining the dangers of that iron-bound coast, has converted them into friendly landmarks for which the sailor may safely steer.

It is worthy of special remark that the magnetic variation throughout these seas was found to be sensibly decreasing; indeed such proves to be the case all over the North Sea, the Irish Sea, and the Channel, and probably extends throughout the greater part of Europe; and the mariner cannot be too much on his guard against the amount of variation he finds marked on charts professing to be corrected up to the present year. The westerly variation in the British Isles appears to have reached its maximum in the year 1836, since which time it has been decreasing at an average rate of about six minutes yearly.

Black Sea.—As in the Baltic, so in the Black Sea, our cruisers have added materially to the charts. To Manganari's atlas of that sea, completed in 1836, several details have been added by Captain Spratt, R.N., C.B., and the surveying staff under his directions, Lieutenants Mansell, Wilkinson, and Brooker, who have discovered several rocks, especially near the Strait of Kertch, and off Anápa on the Circassian coast, which had escaped former examinations. They have also sounded around Kinburn Spit and the estuary of the Dnieper and Bug, leading up to the towns of Khersón and Nicolaief, charts of which rivers, on a large scale, have been published. An elaborate and beautiful plan of the Khersonese peninsula, including Kazach and Kamiesh Bays, and showing the position of the Allied camps and batteries, has been completed by Lieutenant Wilkinson, and is a work that does him the highest credit.

Captain Spratt's reconnaissance of the country between Kustenji and the Danube at Chernavoda, a sketch of much interest in the discussion of the various projects, either of a railway or a canal, to unite the Danube and the Black Sea, has just been published, as also his chart of the Narrows of the Dardanelles, which includes the site of the new hospital at Aren-kieui, in Asia Minor, a few miles from the Plain of Troy.

On the coast of Egypt, Commander Mansell, in the 'Tartarus,' has commenced the examination of the north shore, from the Damietta mouth of the Nile eastwards, with a view to ascertain whether it affords a suitable site for the entrance of a ship-canal, which has been proposed to connect the Mediterranean and Red Sea by the Isthmus of Suez.

South Africa.—The survey of the shores of the Cape Colony advances slowly; yet, notwithstanding the scanty means placed at the disposal of Lieutenants Dayman and Simpson, the officers employed in the survey, they have been enabled to map the coast from Hangklip to Cape Agulhas and the intermediate dangers, on the scale of one inch to a mile, which will be immediately published for the benefit of the mariner. They have also surveyed Algoa Bay and Port Natal. Whatever has been done has been carefully done, and is based on the triangulation carried on by Mr. Maclear, Astronomer at the Cape, from the Observatory as far as Cape Agulhas. Much, however, remains to be effected. Both the land survey of the colony and that of the coasts ought to be pressed forward; every year that they are delayed bars the progress of the settlers, hinders the development of the resources of the district, and is attended with loss to the colonial exchequer.

The Cape Colony has the advantage of possessing a number of accurately fixed points, extending over a surface of more than 400 miles on its western seaboard, and comprising the whole country between Cape Agulhas and the mouth of the Orange River; these were obtained, at the expense of the Home Treasury, in the measurement of an arc of the meridian by Mr. Maclear, her Majesty's astronomer at the Cape of Good Hope; and the only use to which they have yet been put in improving the defective geographic and hydrographic knowledge of this part of the world, has been in the construction of the chart before noticed, of about 70 miles of coast-line between Capes Hangklip and Agulhas, by Lieutenant Dayman of the Royal Navy.

We owe this small contribution to hydrography to a catastrophe which will not soon be forgotten—the loss of H. M. troopship 'Birkenhead' and 656 lives, near Point Danger.

Algoa Bay has been lately surveyed by the same officer on a large scale, but the existing chart of the intermediate line of coast westward to Cape Agulhas is most unsatisfactory. This may be quickly remedied, and at small expense, by extending Mr. Maclear's arc of meridian triangles (the last of which terminates near the Breede River) along the coast to Cape Recife, and it is to be hoped that the colony, under the rule of its present enlightened Governor, Sir George Grey, will perform this necessary duty for its own benefit. A surveying vessel might then find ample field for laborious, but highly useful, employment in these seas.

Indian Ocean.—A chart of the Indian Ocean in two sheets has been recently published by the Admiralty, in which the curves of equal variation have been carefully laid down for the year 1855, by Mr. Frederick J. Evans, chief of the Compass Observatory. It forms a valuable contribution to physical geography. A similar chart of the Pacific Ocean is in progress.

Siam.—A tolerably accurate chart of the Gulf of Siam has lately been published by the Admiralty, in which some of the grosser errors of former maps and charts are corrected. It is still, however, very imperfect; but Messrs. Richards and Inskip, surveying officers on the China station, have been despatched to Siam; and there seems ground for hope, not only from their labours, but from the facilities offered by the present enlightened King of that country, that in the course of the present year the chart of the Gulf will be rendered sufficiently accurate for all the common purposes of navigation.

Japan.—The accidents of the late war have led to a slight improvement in our acquaintance with the coasts of the islands of Niphon and Yesso, and especially as to the Strait of Matsumae, or Tsugar (hitherto improperly named Sangar in all our maps and charts), which lies between them. This Strait has been examined by Mr. Richards, as well as a portion of the west coast of Niphon, which proves to be laid down in all our charts some 10 miles to the eastward of its true position.

Tartary.—Farther north, in the Gulf of Tartary—a quarter not visited by any ship of war since Broughton, in 1797—our cruisers have, during the last year, partially traced the western shore of the island of Saghalin, where coal *in situ* and fallen timber, from the wooded land above, are to be found in abundance along the shores. They have examined Castries Bay on the mainland, and traced a deep-water channel, carrying 3 fathoms throughout, towards, but not into the mouth of the Amúr. Farther to the south-west, in the parallel of 43° N., bays, harbours, and gulfs, which have received the names of Victoria, Eugénie, Napoléon, and D'Anville, have been explored and surveyed by the officers of the Allied squadrons, and especially by MM. Bouchez, Hill, Wilder, Johnson, and May, who have completed a chart which is highly creditable to these young officers. Some useful information has also been obtained respecting the great river Amúr, and of the harbour of Aian and other points in the Sea of Okhotsk.

China.—A slight break has been made in our ignorance of the Gulfs of Pecheli and Leotung, by the visit of Captain Edward Vansittart, R.N., who, in H. M. S. 'Bittern,' chased a fleet of Chinese pirates to the head of the Gulf, where the greater part of them were destroyed. In this dashing affair he boldly took his ship into waters hitherto unexplored, obtained numerous soundings, and corrected approximatively the outline of the eastern shore of the Gulf.

The chart of the island of Paláwan and its off-lying reefs, the result of the elaborate survey of Commander Bate, in the 'Royalist,' between the years 1851-5, has just been published at the Admiralty, accompanied by full sailing-directions. We understand that this skilful officer has returned to China to take command of a ship; may we hope that he will be employed on some service better adapted to his abilities than the usual routine of cruising or carrying despatches. There is "ample room and verge enough" in that region for the labours of several surveyors; large tracts of coast are yet unexplored, and dangerous reefs yet unexamined; and of this latter class perhaps none calling more loudly for immediate examination and marking, both by beacons by day and a light by night, than the extensive coral lagoon-reef of the *Pratas*, barely rising above the level of the sea, lying only 60 leagues to the E.S.E. of our own colony at Hong Kong, and directly bordering on the track of vessels approaching Canton in that direction, either by Dampier Strait or the Gillolo Passage.

New Zealand.—A general chart of this group, comprising the whole of the recent surveys under Captains Stokes and Drury, on the scale of $\frac{4}{10}$ of an inch to a mile, or $\frac{1}{200000}$ of the natural scale, has recently been published at the Admiralty, together with plans of Cook Strait and Port Nicholson, which are important features of the group, as they include the settlements of Wellington and Nelson. The whole is accompanied by a complete set of sailing-directions, compiled by Captain George Richards and Mr. F. J. Evans, R.N. (both assistants on the survey), from the various Admiralty surveys which have been carried on since the year 1848, and are now brought to a close by the return to England of the 'Pandora,' Commander Drury, who brings away with him gratifying testimonials from the colony as to the value of his services in those regions, increased by the promptitude with which he made them available to the navigator, by furnishing accurate accounts of the result of his surveys through the medium of the 'New Zealand Gazette.'

Pacific Ocean.—Capt. Denham still pursues his useful labours in the Western Pacific. Within the past year he has surveyed and fixed the position of Norfolk Island, to which place much interest attaches in consequence of some of the Pitcairn islanders being in course of removal to that spot, as their future dwelling. He has determined the position of Conway Reef, an extensive sandbank only 6 feet above the level of high water, and has planted cocoa-nuts upon it, with a view to render it more conspicuous hereafter, a practice which all navigators will do well to follow for the general benefit of the mariner. On his route to the Fiji Islands, Capt. Denham obtained soundings and brought up bottom from a depth of 1020 fathoms, containing thirty distinct genera of *foraminifera*, most of which belong to existing forms in the Pacific, though only traceable as fossils in the northern hemisphere. Plans of Levuka harbour and island and of the Embau waters in the Fiji group complete his work for the past season.

Farther to the east, in the North Pacific, Fanning Island has been visited by Capt. Morshead, and its true position found to be in lat. 3° 49′ N., long. 159° 19′, or 32 miles to the westward of that usually assigned to it in our charts.

Nova Scotia.—Plans of Halifax harbour and of the coast to the eastward as far as Shut-in-Island, resulting from the surveys of Capt. Bayfield and his party, have been published at the Admiralty during the past year on the respective scales of three inches and one inch to a mile. Their recent labours during the past season have comprised a detailed survey of the coast and harbours from Cape Canso westward to Country Harbour—a laborious and very creditable work.

In the Bay of Fundy, Commander Shortland has completed the survey of the Grand Manan islands at the entrance of the Bay, and a portion of the south-western coast of Nova Scotia. Both the above-named officers are now lending their aid and pointing out the best track for laying the submarine cable that is to connect Cape Ray, the south-west point of Newfoundland, with the island of Cape Breton, a strait only 60 miles in width with a depth of about 200 fathoms. When this connexion is made, there will, we believe, be uninterrupted communication by electric telegraph from New Orleans on the Mississippi to St. John's, Newfoundland, a distance of about 2000 miles.

West Indies.—A plan of Port Escocés and Caledonia harbour, surveyed by Messrs. Parsons and Dillon, has been published by the Admiralty during the past year. These officers have recently been engaged in the examination of the islands of Santa Cruz and St. Lucia, the former of which is finished and the latter far advanced.

South America.—On the coast of Brazil the dangerous shoal known by the Portuguese name of *As Roccas*, lying about 120 miles west of Tristan d'Acunha, has been visited by Lieut. Parish, in H.M.S. 'Sharpshooter,' and, at the suggestion of the British Consul at Pernambuco, cocoa-nuts have been planted in the sand, with the hope that at no distant day they may by their growth serve to warn the mariner of his approach to a danger on which doubtless many a vessel has met its fate.

Rio de la Plata.—In this river, above Buenos Ayres, Lieut. Sidney, with slight means at his command, has re-examined the approach to the river Paraná, and re-sounded the shoals in the vicinity of Martin Garcia. The whole of this vast estuary requires a careful survey. During the past year a sketch-chart of the river Paraguay from Corrientes upwards to Asuncion, by Lieut. Day, R.N., on the scale of one inch to a mile, has been published by the Admiralty; and, on a much smaller scale, the upper part of the river as high as Coimbra, from Portuguese authorities.

In the Falkland Islands a plan of Port Egmont, one of the many safe harbours in that group, surveyed by Capt. Sulivan, C.B., in 1849, has recently been published on a large scale, and may prove useful to the numerous whalers and other vessels which occasionally resort to those islands.

France.—I learn from my zealous and intelligent correspondent, Mr. J. B. Pentland, that the Dépôt Général de la Guerre has continued the publication of its great Map of France, 9 sheets of which have been published during the past year. This magnificent work will consist of 258 sheets, of which 175 have been already engraved. The geodesic operations of this work being concluded, it is proposed to determine astronomically the longitudes or meridian distances of the several trigonometrical stations by means of the electric telegraph; a body of officers appointed for that purpose, under Commandant Roget, are now engaged in the preliminary researches at the Imperial Observatory of Paris.

The beautiful survey, by the officers of the French Etat-Major, of the environs of Rome has been completed, but only one sheet has as yet been published; the remaining ones will, however, shortly be in the hands of the public.

French Maritime Surveys.—The maritime surveyors of France have conducted their surveys along the coasts of Italy and of the Strait of Gibraltar. M. Darondeau has completed the remainder of the survey of Western Liguria; and the whole coast of Italy may now, be said to be completed from the Var to the mouths of the Tiber, and is in course of publication. M. Darondeau is now occupied in conducting operations in the Neapolitan dominions, and has already connected the islands of the Ponza group, with his triangulation of the continent.

The hydrographic expedition despatched by the French Government to survey the Strait of Gibraltar and the adjoining coasts of Morocco and Spain, has most satisfactorily completed its laborious task, thanks to the zeal of Captain Kerhallet, well known by his works on the Currents of the Atlantic and Pacific Oceans, and of M. Vincendon Dumoulin, one of the most eminent of the corps of Ingénieurs Hydrographes of France. The survey, based on an accurate triangulation, extends from Cape St. Lucar on one side, and Cape Spartel on the other, to Gibraltar, and on the northern coast of Morocco as far east as the Zafarina Islands. This excellent survey, I am told, is now in the hands of the engravers. The most important results of the operations of MM. Kerhallet and Dumoulin are the discovery of several new shoals off the Spanish coast; of an extensive rocky plateau, from 15 to 18 miles in length, off Cape Trafalgar; and the correction of various dangerous reefs between Cape Trafalgar and Cadiz. But by no means the least important part of this survey, is the determination of the depth of the Strait of Gibraltar, in olden times supposed to be unfathomable, and continued so until the assumption was dispelled by our able Mediterranean surveyor, Admiral Smyth. The depth of this Strait has been considerably overrated in the Spanish and English surveys, as it has been found in many parts to average from 380 to 490 fathoms only; the greatest depth being 503 fathoms (1010 mètres) about mid-channel, at one mile east of the line extending from Europa Point to Almina, at Ceuta. Numerous observations were made on the set of the currents in the Strait and on the temperature of the sea at different depths, which dispel the belief in an undercurrent setting out of the Strait. We must acknowledge with gratitude to MM. Kerhallet and Vincendon Dumoulin this great addition to our store of improved hydrography and physical geography.

In the catalogue published by the Dépôt de la Marine will be found many new charts of great interest and importance; amongst others, surveys of the French establishments on the coasts of New Caledonia.

Spain.—The Spanish Government has caused a survey of that kingdom to be commenced upon an uniform system, and a part of the preliminary triangulation has been completed. A series of triangles, in a meridional direction, has been carried on from Pico, E. of Malaga, on the coast of the Mediterranean, to Santander, on the Bay of Biscay, and on the direction of the parallels from the Portuguese frontier to Aragon, where it has been connected with the operations of MM. Biot and Arago for the measure of the arc of the meridian between Dunkirk and Formentera. An important addition to Spanish geography has appeared in a work entitled 'Atlas de España y sus Posesiones Ultramar,' of which 25 sheets have already been published, constructed by our much-esteemed Corresponding member, Colonel Coello. These comprise Cuba, Porto Rico, the Philippine, Marian, and Balearic Isles, the Canaries, African possessions, and part of her continental provinces. In addition to these separate maps of the departments of Spain and of her foreign possessions, the Atlas contains enlarged plans of the principal cities and towns, and notices of the statistics, administration, and history of each division, contributed by another of our distinguished Corresponding members, occupying an eminent position as both statesman and geographer, Don Pascual de Madoz.

M. de Verneuil, the eminent French geologist, whose name has often been alluded to by my predecessors, has continued, during the past year, his geological survey of Spain and his barometric levellings. His late researches have extended over the desolate province of La Mancha, where he has fixed the height above the sea of several hundred points.

Italy.—The Piedmontese Government has continued the publication of the map of its continental possessions, on a scale of $\frac{1}{50,000}$, and it is expected that the whole will be completed next year.

The Abbé Poncet has published the number of 360 measured heights in Northern Savoy—an interesting addition to those already given by De Candolle and Professors Chaix and Favre. Mr. Borson has contributed an extract of the geometrical measurements of the Sardinian Staff, which adds the positions and heights of sixty more places to the above.

The Austrian Geographical Institute of Vienna has given the public the last sheets of its great Map of Central Italy, alluded to in previous Addresses of the Presidents of this Society. The map is now accompanied by statistical data of considerable interest concerning Tuscany and the Papal States, and the work, as a whole, is a most useful and important contribution to geographical science.

As to Naples, I am not aware that any progress has been made in the publication of the survey commenced by the late General Visconti, often alluded to by my predecessors.

Switzerland.—From our Corresponding member, M. J. Ziegler, we learn that the geodetical and topographical operations of Switzerland have been continued in the north of the Canton of Tessin and in the chain of the Alps, crossed by the passes of Lukmanier, of Bernhardin, and Splugen. The principal labours which have been executed in the past season were commenced chiefly in a geological point of view, such as that by Dr. Heusser in Valais, which was undertaken in order to make some observations in the environs of Visp, the centre of commotion of the destructive earthquakes which, even to this day, make themselves felt.

Professor Heusser, of the University of Zürich, has visited these places, and has given the results of his personal observations in a little work which the Society of Natural History at Zürich has published. M. Riou has published an account of the earthquakes which were felt in 1855, in the months of July and November. Meteorological observations have also been made during the past winter throughout the whole extent of the central Alps.

By the uninterrupted railway works throughout Switzerland the number of hypsometrical data is increasing, and the interest in hypsometry is becoming greater. Hypsometrical charts are more numerous, and the use of them is becoming general in proportion as we can compare with exactitude the elevation of different countries. I may particularly allude to Mr. Ziegler's Hypsometrical Atlas, in course of publication.

Our learned Associate, Professor Chaix, of Geneva, informs us of the expected return of Messrs. H. de Saussure and H. Peyrot from their journey to Mexico, and that Professor De Candolle has published, in two volumes, a comprehensive treatise on Botanical Geography. From the same high authority our Secretary has just received an interesting communication on the Hydrography of the

Valley of the Arve, which will be laid before the Society at an early period.

Norway.—Our Associate, Professor Munch, of Christiania, has enriched our collection with several recent maps and charts of the Coast Survey of Northern Norway, forming a series, beginning about the 64th parallel and extending to the Russian frontier.

The Coast Survey Charts of Southern Norway have also been received, as well as Professor Munch's Map of Southern Norway, Northern Norway with Finmarken, 1852, and Norway, published at Christiania in 1854; also the Amt Maps, by Captains Ramm and Murthe.

Major Vibe, of the Norwegian Engineers, informs our Secretary that, in addition to the Coast Surveys already mentioned as having been lately published, others, by Munch, Giessing, &c., are in course of preparation.

Denmark.—The Royal Society of Northern Antiquaries has just held its anniversary meeting at the Palace of Christiansborg; its President, Frederick the Seventh, King of Denmark, in the chair. Prof. Ch. Rafn, our Associate, communicated an account of the proceedings of the Society during the past year, and exhibited the new volume of the 'Annales' of Northern Archæology and History; the new number of the Society's Review, and of the 'Mémoires des Antiquaires du Nord.' He also laid before the Society the second part of the 'Lexicon Poëticum' of the Icelandic language, compiled by Sweinjörn. Among the articles in the 'Annales' may be especially noticed 'King Oswald hin Helligés (the holy) Saga,' with a preface by Jon Sigurdsson, and translations by Thorl. G. Repp; also a notice on Virdaland's Ancient History, by Prof. A. Cronholm, of Lund; and a Grammar of the Faeröe Language, by the Rev. V. U. Hammershaimb, of North Stræamey. In the Antiquarian 'Tidsskrift' are found papers on the *Old*-English and *Old*-Norsk, by Gisle Brynjulfsson; on the Ancient Languages of the North, by G. E. Lund; Old-Norsk Remains among the Orkneys, by G. Petrie, Esq., of Kirkwall; Antiquarian Contributions from Sclavic Lands and Monuments of the Bosphorus, by Edwin M. Thorson; Report on the Cabinet of American Antiquities, by Ch. Rafn. In the number just published of the 'Mémoires' are papers on Runic Inscriptions in Sodor and Man, with a Geographical elucidation of the Irish and Scotch names occurring in the Sagas, by

P. A. Munch. The Saga of St. Edward the King, with an Introduction by Rafn and Sigurdsson; Remarks on a Danish Runic Stone from the *Eleventh* Century, lately discovered in the centre of London, with Runic inscriptions, alluding to the Western Countries, by Rafn; and, finally, one by Brynjulfsson, entitled 'De l'Ancien Roman François et de l'Influence exercée sur son Développement par les Normands.' The King communicated to the Meeting the results of the researches which he had carried out among the ancient royal sepulchres at the Cathedral at Ringsted in Seeland; upon which the Vice-President, C. F. Wegener, read a Memoir on the Tombs of King Waldemar the Great, and his Queen Sophia, daughter of Valodimir of Russia. The Secretary read a statement of the progress made during the last year in deciphering the Runic inscriptions so numerous in Scandinavia,—an account of which he is preparing for publication.

Portugal.—We have received, through the polite attention of Count Lavradio, several numbers of a periodical, published by the Portuguese Government, entitled 'Boletim e Annaes do Conselho Ultramarino,' which contains rich contributions to African geography.

Germany.—It is with great pleasure I have to notice the establishment of a Geographical Society at Vienna.

We continue to receive Herr Gumprecht's valuable 'Geographical Journal,' containing the proceedings of the Berlin Geographical Society, in addition to other material.

Hungary.—The ethnographical studies, by M. Valerio, of the various races forming the population of Hungary, have been published, with numerous illustrations.

Greece.—A work on the Peloponnesus, by M. Beulé, appears to form an excellent guide to the Morea, and is worthy of being translated.

ARCTIC.

At the opening of the Address of last year by my noble predecessor, the return of Dr. Rae was announced, bearing with him evidence of the fate of the long missing expedition under the lamented Sir John Franklin; and I have now to notice amongst the papers read at the meetings of the Society, the expedition consequent upon the information furnished by him. You will remember that Mr. Anderson, who conducted this expedition, pursued his route down the river Back, bearing testimony to the great accuracy with which the distinguished navigator, from whom it derives its name, had described and laid down the features of that dangerous river. Among much valuable information which Mr. Anderson collected, will be found the deeply interesting fact of his having discovered upon Montreal Island the remains of a boat, upon part of which was cut the word 'Terror,' and upon the frame of a snow shoe the name of 'Stanley,' the surgeon of the 'Erebus,' leaving no doubt as to the fate of those unfortunate vessels, viz. that they had either been wrecked or inextricably fixed and abandoned; and confirming in all essential particulars the information brought home by Dr. Rae.* The great interest which attaches to this journey of Mr. Anderson, intimately connected as it is with the fate of our countrymen, the sufferings and privations endured by himself and his party, will render this volume of our Journal of deep and general interest.

Scarcely had the breath of novelty passed over this sad but too certain history, when the announcement of the return of our medallist, Dr. Kane, completed the page of past adventure in search of our missing countrymen. The important discoveries of this gallant officer consist of an elongation of Smith Sound to a higher northern latitude than that of any other known land in the Arctic regions, and to a higher parallel than had ever been reached by any navigator, except Parry; and of the discovery of a vast ocean beyond, apparently free from ice, with which it communicated. The patient endurance under hardship, sickness, and privation, the zeal displayed in the execution of this arduous service, and important discoveries in those inhospitable regions, have earned for Dr. Kane the unqualified approbation of this country; and the highest honour this Society has to bestow, has been awarded to him; while the modesty with which he has related his perilous adventures, and the merit he bestows upon all his party, will place his narrative amongst the most fascinating papers in our Journal.

Contemporaneously with the notice of Dr. Kane we announced the return of Commodore Rogers of the United States Navy from the seas to the northward of Behring Strait. He records having ascended Herald Island, from which he could see no land whatever; and having sailed over Plover Island, which he removes from the chart; as also the islands reported to have been seen to the north of

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* Dr. Rae and his companions have now received the award of 10,000*l.* offered by the Admiralty for the first clue to the remains of the expedition.

Cape Yakan. He discovered a vast barrier of ice on the north, so solid as to lead him to declare that no keel has ever divided those waters.

During the last year our indefatigable Captain Collinson has returned to our shores from Behring Strait, rich in Arctic enterprise, and enjoying the distinguished honour of having, by skill, energy, and patient endurance, brought his vessel, the 'Enterprise,' safely back from her perilous adventures, and returned her to the shores, whence he departed with her; an act which should not be overlooked in the catalogue of the meritorious deeds of that highly scientific navigator. About the same period appeared 'The Last of the Arctic Voyages,' by our associate, Sir Edward Belcher; in which he gives an account of his proceedings, and of the many land and boat journeys undertaken by himself and officers under his command; completing, through their instrumentality, the northern coast of the Parry group, and adding Victoria Land and other geographical features to the cartography of those regions. Then, as if to swell the mention of Arctic enterprise, at this time appeared a reprint, by the Hakluyt Society, of the quaint but interesting documents of old voyages; and also a voluminous summary, entitled 'Scoperte Artiche,' compiled for the enlightenment of the Italians, by Conte Francisco M. Erizzo. Lastly, I have to notice among the events of the past year, as connected with Arctic enterprise, the bestowal of the honour of knighthood upon Sir Robert M'Clure (our medallist), the gallant officer who virtually accomplished the North-West passage—a justly-merited tribute of the nation, and a token of the high sense it entertains of the worthy deeds of those navigators who had so laboriously pursued their perilous researches in those ice-encumbered seas.*

At this period of Arctic discovery it will perhaps be expected that I should offer some remarks upon the results and the benefits which have been derived from it by the country.

It is now nearly forty years since the revival of our Polar voyages, during which period they have been prosecuted with more or less success, until, at length, the great problem has been solved. Besides this grand solution of the question, these voyages have in various ways been beneficial; and Science at least has reaped her harvest. They have brought us acquainted with a portion of the globe before unknown. They have acquired for us a vast addition to our store of knowledge—in magnetism, so important an element in the safe conduct of our ships; in meteorology; in geography, natural and physical; and which has led to the prosecution of like discoveries in the regions of the Antarctic Pole. They have shown us what the human frame is capable of undergoing and of accomplishing under great severity of climate and privation. They have opened out various sources of curious inquiry as to the existence at some remote period of tropical plants and tropical animals in those now icy regions, and of other matters interesting and useful to man. They have, in short, expunged the blot of obscurity which would otherwise have hung over and disfigured the page of the history of this enlightened age; and, if we except the lamentable fate which befel the expedition under Sir John Franklin, we shall find that they have been attended with as little if not less average loss of life than that of the ordinary course of mankind. And if any one should be disposed to weigh their advantages in the scale of pecuniary profit, they will find that there also they have yielded fruit, if *not to us*, at least to a *sister nation* in whose welfare we are greatly interested, and whose generous sympathy in the fate of our countrymen endears her to us, and would render it impossible that we should begrudge her this portion of the advantage of our labours. I need hardly remind you of the Report from the Secretary of the United States Navy to the Senate, to the effect that in consequence of information derived from one of our Arctic expeditions to Behring Strait, a trade had sprung up in America by the capture of whales to the north of that Strait, of more value to the States, than all their commerce with what is called the East! and that in two years, there had been added to the national wealth of America, from this source alone, more than eight millions of dollars.

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* The sum of 10,000*l.* was also voted to him and his gallant companions by the House of Commons.

AFRICA.

I would next direct your attention to a region widely different in its physical character to the last, but one in which we have alike pushed our discoveries, with slow and occasionally painful progress, it is true, but upon the whole with steady success—the region of Africa. It is from this country I have to congratulate the Society on the safe return of that distinguished traveller Dr. Barth, the successful explorer of a large portion of Central Africa, and of the famed city of Timbuctú. An account of this expedition is now preparing by Dr. Barth for publication, in five volumes, with maps;

and, from the extent of the work and the care bestowed upon it, we may expect to derive an enlarged knowledge of the country through which he passed.

From letters communicated by the Foreign Office, we learn that Dr. Vogel was at Gujeba in January last, and had thence proceeded to Yakoba. His last letter is from Gombé. It appears that, in attempting to reach Adamaua, he had crossed the Binué, at a point where the steamer under Dr. Baikie had stopped, and that he there left letters in expectation that another steamer would be despatched up the Chadda. We learn with regret from Dr. Vogel that his health had suffered, but, on the other hand, we have cause to be thankful that his life had been saved through an accident, which prevented his joining a party of fifty persons going to Yola, all of whom, except two, were murdered the same day.

Our associate, Dr. Baikie, has recently published an interesting and instructive description of the voyage of the 'Pleiad' steamer up the Niger and Chadda, including a map from the original survey by Mr. May, R.N., and much general information respecting the nations and countries of that important part of Africa. In the mention of this work, which reflects credit upon its author, I must not omit to notice an oversight which I am sure Dr. Baikie will, with his usual candour, acknowledge. In alluding to the origin of the Expedition, Dr. Baikie does not mention the persevering part taken by the Council of this Society, and particularly by Sir Roderick Murchison, in promoting it; and he has entirely omitted to connect the name of M'Leod with the great and novel feature of the plan which rendered this Expedition so successful in all respects, and will govern the operations, in regard to season, of all future expeditions. It will be seen in our Journal that, early in 1852, a project for ascending the Niger *with the rising waters*, was laid before the Council by Lieut. Lyons M'Leod, who had been employed for some years on the African coast. Having been referred to the Expedition Committee, attention was directed to a clause in Mr. Laird's mail contract with the Admiralty, which provided for the ascent of one of the African rivers, by steam, at a small expense; and the Committee recommended Lieut. M'Leod to communicate with Mr. Laird and adapt his plan to this arrangement. Other steps were also taken and communicated to the Society by Sir Roderick Murchison, in his Presidential Address of that year. In 1853 the Expedition having been brought under the notice of the Government by Sir Roderick, as President of the Society, some progress was made, but a change in the Cabinet caused delay; and in the mean time the arrival of Dr. Barth on the banks of the Upper Chadda, directed attention to that branch of the Niger, and turned the proposed course of the Expedition towards it. The plan received the warmest encouragement from Lord Clarendon, but the favourable season being past, it was necessary to defer proceedings till the ensuing year. These circumstances were also laid before the Society in the Presidential Address for 1853. In 1854 the Expedition started, and it was intended that the veteran African explorer, our late member, Mr. Consul Beecroft, then residing at Fernando Po, should take the command; but his lamented decease having occurred a few days before the arrival of the party from England, the command devolved upon Dr. Baikie, with whom Mr. May, of her Majesty's ship 'Crane,' was associated as surveyor, through the kindness of Captain Miller, R.N., F.R.G.S., then chief officer on the station.

I have felt it to be due to the persevering efforts of this Society in promoting this Expedition, and to the individuals whose names are so honourably connected with it, to insert in some detail these facts connected with its origin; of which, I am sure, Dr. Baikie will acknowledge the justice and propriety.

The spirit of adventure is again revived: Dr. Baikie, the successful explorer of the Chadda, has offered his services to conduct an expedition up the Niger, and, leaving a trading party at Rabba, to pursue his route thence by land to Sokatú, the residence of the Sultan, whose influence is said to be so great, that could it only be obtained, an impulse would be given to commerce, and slavery would be annihilated.

A communication from Governor O'Connor, describing a visit to the Island of Bulama, in the Bisagos group, and a voyage up the river Casamance, informs us of the present condition of those places, and the state of the settlements there.

Captain Skene, R.N., of the 'Philomel,' is about to return from the West Coast, where he has ascended the Bonny, the Congo, and the river of Lagos, and from whose journals we may expect some interesting information.

We learn that Commander Lynch, of the United States Navy, has examined a large part of the coast of Liberia, and several of its rivers, as a preliminary to an exploration of the interior. Sickness, however, obliged him to discontinue his labours.*

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* Of the death of Dr. Schönlein, at Cape Palmas, mention has already been

We may mention here that M. Raffenel has at length published an account of his failure to penetrate to the interior of Africa from the French settlements on the Senegal.

Comte d'Escayrac de Lauture has presented the Society with a copy of his Memoir on Soudan, accompanied by a map, in which the positions of the principal towns and the courses of the rivers in Central Africa are discussed with great ability and research, and the habits of the people are also described. The Count has just proposed to attempt, with the assistance of the Egyptian Government, the ascent of the Nile to its sources.

The enterprising Sardinian trader, M. Brun-Rollet, whose establishment on the White Nile was mentioned in my noble predecessor's last Address, having returned to his outpost of exploration and commerce in that region, has since penetrated for a considerable distance along the Misselad; and we are indebted to our Corresponding member, M. le Chev. Negri, of Turin, for the following account of M. Brun's proceedings, dated from the banks of the Misselad, Feb. 1, 1856:—

"After a month's research M. Brun-Rollet came to reconnoitre the lake, by which the waters of the Misselad and of the Modj or Lút communicate with the Bahr el Abiad. He found it about 50 leagues in length from north to south, and discovered the entrance of the Misselad into the lake. He entered the Misselad with three boats (barques), and an escort of 23 soldiers, obtained from an Egyptian post recently established at the confluence of the Sanbat, in the Bahr el Abiad; and the intrepid traveller had already ascended the river for nearly 40 leagues, with the determination to push his exploration as far as possible. The Misselad appears to be so large and deep that M. Brun-Rollet, who has previously visited the Blue Nile, or Bahr el Azrek, as well as the White Nile, or Bahr el Abiad, declares *that he has no doubt of the Misselad being the true Nile.* It appears that during the rainy season this river inundates an immense extent of country. The vegetation of this region is magnificent, and the reception offered by the inhabitants, although not always favourable, had not been hostile. M. Brun-Rollet and his companions, among whom is Madame Brun-Rollet, a young Marseillaise, continued to enjoy excellent health."

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made in the Third number of the Proceedings of the Society; and it is with much regret that I now hear of the decease of a young French explorer, M. Couturier, which took place at Brezina, an oasis in the Sahara, where he had stopped some time in order to acquire a knowledge of some of the native dialects.

From the Eastern Coast we have received, through the Church Missionary Society, an interesting communication from the Rev. J. Erhardt, informing us concerning a large inland sea, long known to exist, and now stated to extend over nearly ten degrees of latitude and four degrees of longitude, with a description of several routes by which different portions of this sea are visited by parties from Mombas, Tanga, Mbomaji, Kiloa, and other towns upon the sea-coast, affording facilities for discovery in that quarter, which the Council have not neglected.

Lower down, upon this coast, we have received information of the return of a party of Moors from the Western Coast of Africa. The 24th volume of our Journal contains an account of a journey performed by a party of Moorish traders from Zanzibar to Benguela, on the West Coast. This is the same party whose arrival we have just announced. It appears that they left Benguela on the 9th June, 1853, and arrived at Mozambique on the 12th November, 1854, crossing large rivers and passing many thickly-inhabited towns in their way; but they do not afford us any means of determining the positions of these places.

I must not conclude these brief remarks upon this continent without calling your attention to the limited extent of our knowledge of that portion of it known as Equatorial Africa. This extensive region, occupying nearly twenty degrees of latitude, and extending from coast to coast, with the exception of the fringe of the shore on either side and the limited discoveries up the Bahr el Abiad, still remains to us almost a "terra incognita." As before observed, we have pushed our expeditions from time to time over its borders, on the north and south and on the east and west, but with sufficient success only to ascertain the general feature of the country in those directions, and to inform us in what quarter we may with the greater advantage direct our future movements. Equatorial Africa really lies still unexplored, and yet, by information from various sources, it seems to present a fruitful field to travellers. The thickly-inhabited towns and large rivers mentioned by the Arabs—the vast inland sea of Niassa mentioned by Erhardt—alone would immortalize the discoverer who should undertake the task; while the existence of mines of copper and other precious metals in that direction, if true, would bid fair to repay the toil.

The source of the Nile, yet undiscovered, lies mysteriously hidden in this vast unexplored region, and, with Niassa, asks who shall unlock its mysteries? We trust that this question will not long remain unanswered, nor this vast inland region continue almost a blank upon our maps. There are not wanting, in this and other countries, men both willing and able to undertake the task. The gallant Commander of the expedition from Zayla to Harar, Captain Burton, has volunteered to proceed from Zanzibar inland towards the famed Sea of Niassa, and, after exploring its locality, to turn northward towards the Bahr el Abiad; and I will here mention that the Council are now in communication with the Foreign Office and the East India Company, on the subject of the means for sending out an expedition in this direction, a deputation having already had interviews with the Earl of Clarendon.

In Southern Africa, our medallist, Dr. Livingston, is still prosecuting his indefatigable researches. At the last Anniversary, we learnt that he reached Loanda in an exhausted condition, labouring under the effect of fever. His journey thither will be found most interesting, and will well repay the perusal. He then announced his intention of returning to the interior, and of visiting the great chief Muata ya Nvo, or Matiamvo, and of ultimately descending the Leeambye to Quilimane, on the east coast of Africa. By a letter from him at Cassangé, we learn that he had so far carried out the first portion of his plan; but from other sources we are informed that he left Cassangé in February last, crossed the Quango, and pushed on for a trading station, named Cobango, on the river Chihombo, with a view of carrying out his before-mentioned intention of putting himself in communication with Matiamvo. On reaching this place his health was found to have suffered much, from having slept several nights upon a vast plain entirely covered with water; and he was compelled to abandon his intention of visiting Matiamvo, and obliged to strike off southward towards the country of his companions, which he appears to have reached in safety, and in excellent health. Dr. Livingston's observations have been communicated to the Society by Mr. Maclear, the astronomer at the Cape, by whom they have been recalculated and found to be of the most satisfactory character—a feature, in the qualification of a traveller, of the first moment, and which this Society will do well to encourage.

In connection with discovery in the south-east part of Africa, Mr. Moffat, the father-in-law of Dr. Livingston, anxious to learn his fate and to forward supplies for him, had proceeded to Moselekatse's country, the full accounts of which interesting visit have been kindly forwarded to us, by the London Missionary Society, and will be printed in the Journal.

On the South-West, Mr. Hahn, the Rhenish missionary, had left Cape Town for Walfisch Bay, for the purpose of proceeding thence overland to Mossamedes. It was the intention of Mr. Hahn to settle near the mouth of the river Nourse, or Cunené, north of the Ovampo Country, and thence to make expeditions inland along its course. This river appears to be the shortest and most healthy road to this part of the interior.

That persevering and hardy explorer, Mr. Charles John Andersson, to whom the Council adjudged, last year, one of the Royal awards for his journey to Lake Ngami, has published an excellent account of his labours in South Africa, with a map, and many striking illustrations. Mr. Andersson has again started to renew his pursuit of African enterprise, and he also intends directing his attention to the Cunené River.

Lastly, I have to mention M. Lesseps' very interesting pamphlet and map of the Isthmus of Suez, showing the line of a canal which it is proposed to make between the Mediterranean and the Red Sea.

The importance of a ship canal from the Mediterranean to the Red Sea cannot be overrated in a commercial point of view, and especially to this country, when considered in connection with its Indian possessions and colonies. M. Lesseps has shown its importance in other respects, by opening out fresh sources of trade along the shores of the Red Sea itself, and otherwise; and we can only hope that the project, if undertaken, will realize the expectations it has created. The map is a good specimen of chromolithography.

If to these prospects, we add results which may be expected from our indefatigable Associate, Dr. Sutherland, who is a resident at Natal; and from the projected expedition of the United States, *viâ* Liberia on the west—from the continuation of Livingston's labours in the south—from the appointment of Mr. M'Leod as consul at Mozambique, and from the encouragement offered by the French Geographical Society in the shape of rewards for discoveries in Africa—we may hope to see discovery pushed forward in that continent with vigour; and posterity may possibly witness the resources of this vast continent, brought under the influence of European civilization, its geography known, and its inhabitants emerge from barbarism and slavery.

ASIA.

India.—By far the most important work in this quarter of the globe that has been laid before the Council in the past session, is that of the Trigonometrical Survey of a large portion of India, by Lieut.-Colonel Waugh, the Surveyor-General of India.

This work consists of geodetical operations of the highest order, carried on through countries for the most part unexplored, and, until lately, inaccessible to Europeans, or, in the words of the Society's motto, "*Terræ Reclusæ.*"

The first series of this important work is mentioned by my noble predecessor in his Address, as extending from the Seronj base to Karachi; and I gather from a paper laid before the Council by our Vice-President, Colonel Sykes, that the second series of operations branches off to the north-west, from the great meridional arc at Banog and Amsot, through the plains of the Punjab, and along the southern face of the Sub-Himalaya ranges to Attock and to Peshawur. At Attock, a base of verification was measured. This series extends over seven degrees of longitude, and over a space of more than 100 miles in width. The third series consists of meridional arcs passing through Sind and the Punjab from Karachi to Attock, thereby uniting the before-mentioned bases of verification at those places; and the whole completes a gigantic geodetical quadrilateral, of which the great arc, between Seronj and Banog, forms the western side, and corresponds with a similar grand quadrilateral on the eastern side, begun and partially completed by our Associate, Colonel Everest, &c.

Too much praise cannot be bestowed upon this most elaborate and important work, carried on as it has been with such precision through countries almost wholly unexplored and injurious to the health of Europeans.

From Mr. J. Walker, the Hydrographer to the East India Company, we learn, that after the measurement of the base of verification near Karachi, a party remained to observe the latitudes, and to compute and register tidal observations; while another party was detached to build towers, to facilitate the triangulation of the Great Indus series. Another party also has been engaged on the North-West Himalaya series, the operations of which were carried on in the region of perpetual snow, and it required all the energy and determination of the parties to accomplish the work assigned to them. The Assam longitudinal series had proceeded eastward, as far as longitude 89° 30' 29", when the party was obliged precipitately to withdraw for the season on account of the floods. The South-Coast series has been extended to Kuttack; its farther progress, however, was retarded by the whole party having been prostrated by fever.

Topographical.—The Survey of the Plains of the Punjab advances satisfactorily. The work, we are informed, will be executed in a style not inferior to that portion which has already been submitted to the inspection of the members of this Society. The Ganjam Survey continues to progress. As it is now being carried on in a country hitherto almost a blank in our maps, and through a number of petty states, the names of which were hardly known, its completion is looked forward to with much interest.

Revenue.—These surveys are proceeding steadily. The districts of Rajeshaye, Goalpara, and the Julindher Dooab have recently been completed.

Fifty sheets of the 'Indian Atlas' are now published. Several others will be finished during the ensuing season.

Marine.—A new and elaborate survey of the harbour and outer roads of Karachi, has been executed on a large scale by Lieut. Grieve, I.N., and is now being engraved. This harbour, in connection with the railway and electric telegraph, will no doubt become one of the most important stations on the western coast of India. Another sheet of the Survey of the Malacca Strait, extending from Cape Rachado to Mount Formosa, by Lieut. Ward, I.N., has recently been sent home. The Survey of the North Preparis Channel, in the Bay of Bengal, extending from Preparis Island to Cape Negrais, by Lieut. Ward, has also lately been published.

Turkey in Asia.—I have next to notice a memoir on the Map of Damascus, the Hauran, and mountains of Lebanon, from personal survey, by our associate, the Rev. J. L. Porter, containing various journeys in Syria, in the performance of which he corrected many errors in the received geography of that country. About Damascus, he finds that the Bahr el Merj is not one lake, but three distinct lakes, and that the plain around Damascus contains many villages, none of which appear on the map. Balbeck is in error in its bearing from Damascus; the Antilibanus chain requires correction. Thus the author proceeds, pointing out numerous errors in the topography of the country, and concludes by observing that the present Ard-el-Bathauzel is the ancient Batanea.

Mr. Arrowsmith is preparing a beautiful map of Syria and Palestine, in three sheets, for the Foreign Office.

We have next an important paper, comprising notes of a journey from Busrah to Bagdad, with descriptions of some Chaldean remains, by Mr. William Kennett Loftus.

In this paper the author furnishes a highly interesting description of the country through which he passed, both in a geographical and antiquarian point of view. He visited the sites of some of the most ancient cities upon record, comprising those of Babel, Erech, Accad, and Calneh, mentioned in the Bible; and, as Sir Henry Rawlinson has observed, Mr. Loftus may be considered as the discoverer of Wurka, perhaps the Erech of the Bible. Mr. Loftus gives minute details of the country and of the various modes of irrigation. He particularly directs attention to the effect of the Hindieh Canal, a branch of the Euphrates, which diverts the main stream from its proper channel, thereby occasioning drought and causing the inhabitants of the villages, in the interior of Mesopotamia, to desert their lands. The Hindieh passes through the Bahr el Nedjef, and forms the Semava branch of the Euphrates. The paper contains much important and valuable information.

It will be remembered that in 1848 a Commission was formed for the purpose of determining the boundary line between the Turkish and Persian empires. Its members were appointed by the English, Russian, Turkish, and Persian Governments, and designated the Turco-Persian Frontier Commission. The chief of the English party was Colonel Williams, the present celebrated Sir William Williams of Kars, under whom Lieutenant Glascott, R.N., acted as chief surveyor, and Mr. Loftus as geologist. We learn from Mr. Loftus, that the surveys extended from Mohammerah to Mount Ararat, a direct distance of about 600 m.; the operations being trigonometrical on an astronomical basis. The opportunities which occurred for extending the examination of the country enabled careful route surveys, corrected by nightly observations, to be extended as far as Shiraz on the S.; along the plains of the Euphrates and Tigris to Zobeir, Meshid Ali, and Mosul on the W.; and across the mountains on the E., along the high plains of Persia, as far as the tomb of Cyrus, Ispahan, Hamadan, Lake Urumia, and Bayazid. The Commission had returned to Constantinople, and were engaged in elaborating the results of their labours when the late war broke out, and a separation of the parties constituting the Commission took place; the Russians taking with them that portion of the observations which they were contributing.

The accuracy of Lieutenant Glascott's labours has been remarkably exhibited in working out the triangulation of this survey, and the Society has already been indebted to that officer for his map of Kurdistan on a scale of 6 inches to a degree, accompanied by a list of his astronomical positions, which appeared in the sixth volume of the Journal.

The return of peace will, it is hoped, admit of the production of the invaluable geographical material resulting from the international researches of the Commission.

The Vestiges of Assyria, surveyed by order of the Government of India, by Commander Jones of the Indian Navy, and published in three sheets, exhibit the topographical features of the country, in which are situated the ancient cities of Nineveh, Mosul, and Nimrud, over which the labours and writings of Layard and Rawlinson have thrown such a charm.

The return to this country of that distinguished and learned scholar in Eastern languages, Colonel, now Sir Henry Rawlinson, has been announced; and we learn that he has brought to a close, for the present, the excavations in Assyria and Babylonia. A notice of some of his labours has appeared in the Transactions of the Asiatic Society; but they are far beyond any attempt of mine to do justice to them, either in point of value or description. It is with pleasure we learn, that he intends devoting his time to describing his labours and to decyphering the numerous inscriptions he has collected, &c. &c.; a work which, if he succeed in accomplishing, must entitle him to the gratitude of the world: for, hidden under those mysterious mounds and written in those dark inscriptions, may we not hope to find the history of a great nation, whose existence was collateral with that of Israel, and which at many points touched that of the sacred people? May we not hope to read in the records of Assyria, additional proof of those wars and slaveries which are spoken of in the Bible, and to discover traces of those captives, who sat down and wept by the waters of Babylon, and hung their harps upon the willow-trees of a foreign land?

Persia.—Abbott's 'Itineraries in Persia' contain descriptions of such parts of the route from Tehrán through Savé, Kúm, Kashan, and Ispahan, and thence to Yezd, Kerman, Shiraz, and Bunder Bushir, on the Persian Gulf, as have been but seldom or never visited by European travellers. From Bunder Bushir he crossed the Persian Gulf to the mouth of the Shat-el-Arab, as the joint stream of the Tigris and Euphrates is called, and thence by Mohammerah to Bagdad, and by Kermanshah and Hamadan to Tehrán. The route is carefully kept by compass-bearings and estimated distances, and the descriptions of the country, towns, and inhabitants, are carefully given.

Siam.—I mention next in order 'Notes on Siam,' with a new map of the lower part of the Menam River, by our Associate, Mr. Henry Parkes; also an interesting paper, which affords extensive information of the inhabitants, productions, and commercial resources of a country of which we had before but a very imperfect knowledge.

Chinese Empire.—Having already alluded to Mr. Meadows' work on China, I have only to mention the publication of a new map of Corea by Andrew Kim, edited by M. Jomard; and to allude to the want of a better knowledge of the northern seaboard of China and of North-eastern Asia generally, including particularly its navigable rivers, which recent events have proved to be so little known.

AMERICA.

North America.—During the present session, the United States Government has presented to the Society, the reports, plans, and sections of the several important expeditions despatched by order of Congress to discover the best route for a railway from the Mississippi to the Pacific, between the 32nd and 49th parallels. These expeditions, organized by the Secretary of War under various leaders, have contributed very largely to American geography, observations having been made from the Mississippi to the Pacific, between the 49th and 47th parallels—the 41st and 43rd—also near the 38th, the 35th, and the 32nd—touching upon the ocean at Puget Sound, San Francisco, S. Pedro, and S. Diego. The report of the Secretary of War, on the results of these labours, concludes, "that the route of the 32nd parallel is, of those surveyed, the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean." Other important additions to a knowledge of the North American continent have been communicated in the Ninth Report of the Smithsonian Institution. Lieut. Beale, superintendent of Indian Affairs in California, accompanied by Mr. G. H. Heap, travelled from Westport, Missouri, to Los Angelos, on the Pacific, in 100 days, following the route, near the 38th parallel, to the Little Salt Lake, then turning southwesterly, across the Mohave desert, to the Pacific.

Our gallant medallist, Colonel Frémont, also made a special journey, along the same route, to test the depth of winter snow in the mountainous region. He reached the Huerfano on December 3rd, passed the Coochetope Pass on December 14th, where he found only four inches of snow, and reached the Little Salt Lake settlements on February 9th.

Under the auspices of the Smithsonian Institution, an examination of Northern Wisconsin has been made by Mr. Baird, in regions almost unknown before, and several lakes and rivers have been discovered and named by him.

Captain Marcy has explored the head waters of the Brazos and Big Witchita Rivers, in Texas, a region never before trodden by white men; and a survey of the United States and Mexican boundary was also commenced by Major Emory.

Lieutenant Couch, of the United States' Army, has made a scientific journey into Mexico, at his own expense, leave of absence having been granted to him, at the instigation of the Smithsonian Institute. He went to Matamoros and Monterey, examining the adjacent sierras; thence he proceeded to Parras, the plains of Mapimi, and the Caves of Durango. Among other motives for this journey, was the acquirement of a large collection of manuscripts, maps, and natural objects, made by Luis Berlandier, a Swiss, and a member of the Academy of Geneva, who had resided in Mexico, and devoted himself to Mexican research from 1826 to 1851, when he died. This collection was found very valuable, and purchased from the widow. A catalogue is appended to the Smithsonian Report.

Among various works which have appeared, and which throw light upon the geography and ethnography of America, I notice a 'Mémoire sur les Anciennes Populations Mexicaines,' by M. Ludewig; a treatise on the Hydrography of the Ohio, by Charles Ellet; a notice and map of the projected canal between the Pacific and Atlantic through Nicaragua, by M. Dupuy. Mr. J. H. Coffin has written upon the distribution of winds in the northern hemisphere; and great light has been cast on the comparative philology of the American languages by the labours of the Rev. R. S. Riggs, and his acquirement of the Dakota language. Mr. Julius Froebel has furnished a work on the Physical Geography of North America; and I notice an excursion to the ruins of Abo, Quarra, and Gran Quivira in New Mexico, by Major J. H. Carleton, U.S.A.

Central America.—In Central America, Mr. E. G. Squier, formerly Chargé d'Affaires of the United States to the republics of the Isthmus, has pursued his indefatigable researches so far, as to cause a survey to be made of the country lying between Puerto Caballos in the Bay of Honduras, and the Gulf of Fonseca on the Pacific. The results of this investigation have been stated in a Report, advocating the construction of the Honduras Interoceanic Railway; and also in a volume by Mr. Squier, entitled 'Notes on Central America, particularly the States of Honduras and San Salvador, their Geography, Topography, Climate, Productions, Population, &c.;' with an original map and sections, which the author has presented to our library.

Our active associate Mr. Power, of Panama, has recently presented to the Society an important addition to the geography of Central America, in a tracing of an original manuscript map of the province of David, on the frontiers of New Granada and Costa Rica, made from a new survey by Colonel Codazzi. This survey has enabled an interesting portion of the Isthmus to be delineated which was previously a blank on our maps.

West Indies.—The Geography of Cuba has been published by Don Esteban Pichardo, under the auspices of the Royal Junto of Fomento.

Among the Papers of this Session, I notice the Landfall of Columbus, by Captain A. B. Becher, R.N. The first land in the New World that was seen by the great Genoese adventurer is a point of considerable historical interest. Hitherto, in this country, the subject has been treated in works of biography and history; but it has now been taken up by a really practical hydrographer, and the records of the Spanish archives compared step by step with the configuration of accurate modern charts. In like manner, the spot where Julius Cæsar first planted his foot upon British ground was treated of by the most eminent geographers of their day—D'Anville, Halley, Rennell, and others; but it has been left for the enlightened Astronomer Royal, from an investigation of certain phenomena which modern science had brought to our knowledge, to prove, with almost mathematical certainty, the precise spot in dispute; * and thus, by assiduous research and comparison, has our Assistant Hydrographer arrived at conclusions by means of modern delineations with respect to the Landfall of Columbus, which seem to be worthy of equal attention.

South America.—The progress of geographical research in South America has been scarcely less active than in the northern and central parts of the great Western continent.

New Granada.—The course of the navigable river Atrato, which falls into the Gulf of Darien, has been subjected (along with its western affluents and the adjacent streams flowing to the Pacific) to the investigations of several surveying expeditions, despatched by Mr. F. M. Kelley, of New York, at his own expense. For more than fifty years, Baron Humboldt had continued to direct attention to the facilities, which the Atrato was reported to present, for establishing water-communication between the Atlantic and Pacific Oceans. Actuated by the writings of the veteran geographer, Mr. Kelley has caused the whole course of the Atrato, from its mouth to its head-waters, to be surveyed; and having discovered a route, by way of the Truando, which he deems to be favourable for a ship-canal, he has considered the subject to be of so much importance to the great maritime powers, as to invite an international investigation before any further steps are taken. The scrutiny of the project, which Mr. Kelley has invited from geographers and from civil engineers in this country, has, upon the whole, been favourable to his plan; and his proposal to make a more perfect examination of the locality, seems to be a project well deserving of encouragement.

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* *See* 'Archæologia,' vol. xxxiv.

Lieutenant Gilliss, of the United States' Navy, has presented to the Society two quarto volumes, published by order of Congress, comprising a portion of the results of "the Astronomical Expedition to the Southern Hemisphere" under his orders in the years 1849 to 1852.

Chile.—The first of these volumes, besides a summary of the scientific observations made by Lieutenant Gilliss and the officers under his command in Chile, contains a personal narrative of their journeys in that Republic, and many interesting particulars regarding its present political state. In describing its physical geography Lieutenant Gilliss has frankly acknowledged his obligations to the scientific individuals who, under the patronage of the Chilean Government, have been for some years engaged in investigating, surveying, and describing the geology, topography, and natural resources of the Republic, especially Messrs. Claude Gay, Professor Domeyko, and Messrs. Pissis and Allan Campbell, whose labours have been long known to us in Europe.

It was a source of great satisfaction to Lieutenant Gilliss, upon the completion of his own astronomical observations, to find that the Government of Chile was desirous to purchase the valuable instruments he had with him, as well as the observatory which he had set up. These were handed over to them; and thus Chile may boast of a national observatory, in addition to the various other scientific institutions, already founded by the liberality and enlightened policy of her rulers.

The second volume contains the results of a journey made by Lieutenant MacRae, the next officer of the expedition, across the Cumbre and Uspallata Passes of the Andes, and from Mendoza to Buenos Ayres, his instructions being to make a series of observations for elevation, latitude, and longitude, as well as magnetical and meteorological, for each 3000 feet of elevation on the slopes of the

Andes, and for each 100 miles of longitude on the line of road across the Pampas,—a task which he completed in 60 days.

The results, which are given in a tabular form, constitute an important collection of authentic data for geographers. It is satisfactory to observe how they corroborate the accuracy of the labours of the old Spanish officers, Bauza and Espinosa, whose map of the same line of country over the Pampas was published in the Hydrographic Office at Madrid in 1810. A copious appendix gives a particular account, drawn up by various learned individuals in the United States, of the Indian antiquities, and of the zoological, botanical, and mineralogical collections made by the officers in the course of their travels.

These volumes are beautifully embellished by well-executed plates, especially the natural history part; and the work reflects great credit not only upon the scientific attainments of the officers employed in carrying out the great astronomical and geodesical work entrusted to them, but also on the industry and ability with which they have brought together a large and varied mass of information regarding the countries they passed through; and the Government of the United States has done but justice to their labours in publishing the results of this important survey in the most liberal manner at the expense of the State.

Brazil.—The labours of our Honorary Member, Dr. Martius, in Brazil have come before us recently under a new form, in a volume presented to us by the author, containing fifty beautiful views illustrating the vegetation of Brazil.

Paraguay.—From Lieut. Page, commanding the U. S. Steamer 'Water Witch,' we learn, under date "Buenos Ayres, Dec. 26, 1855," that "the embarrassments arising from the jealous prohibition of the Government of Paraguay have, to such a degree, contracted the field of operations, as to deprive this expedition of the privilege of making contributions to geographical science and natural history to the extent that I had anticipated. I nevertheless hope that our labours will prove not to have been in vain in either of those fields, and that the result may give rise to commercial intercourse with countries fruitful in natural products and susceptible of extended and varied cultivation, but whose resources as yet lie dormant, waiting for the hand of energy and industry to awaken them to life. I allude particularly to those provinces most directly interested in the navigation of the river Salado, a river rising in the Cordillera, in the western part of the province of Salta, and discharging itself into the Paraná at the town of Santa Fé.

"By our exploration of this river we have shown that the Salado is navigable to within the province of Santiago, without presenting an obstacle, and that, with the expenditure of a little labour, it could, in the course of a few months, be made navigable to within the province of Salta, a distance of not less than 900 miles by land.

"The navigation of this river will open to the provinces Jujui, Salta, Tucuman, Catamarca, Santiago del Estero, parts of Cordova and Santa Fé, an easy way by which to transport their products and merchandise, which now, under the most disadvantageous circumstances, are conveyed in ox carts of the most unwieldy construction, involving an expenditure of time and money, and prohibiting the exportation of many valuable articles of commerce which could easily and profitably be transported by the river.

"The river was ascended in a small steamer from its mouth, the distance of 150 m. in a right line, and 350 by the river. This being in July (the season of low water), the steamer could not ascend higher. The river was then entered from its upper waters; its difficulties, its obstacles to immediate navigation throughout the above extent, carefully examined; its rise and fall considered; and the result showed no obstacle that may not easily be removed; and none of those obstacles, such as shoals and banks, which, when removed from one place, reproduce themselves in another.

"We have recently discovered also a new channel between the island Martin Garcia and the coast of the Banda Oriental, of 2 ft. more water than the old channel contains. The importance attached to this discovery is not confined to the greater depth of water in the new channel, but it assumes a political character. It deprives Martin Garcia of that important geographical position which is attached to it by the Government of Buenos Ayres, in whose hands it is at this time. Instead of Buenos Ayres possessing, as she now claims, exclusive jurisdiction over the old channel, leading into the rivers Paraná and Uruguay, on the ground that her territory is on both sides, over the new channel, she has only concurrent jurisdiction with the Banda Oriental. The new channel is more easily entered, and in it vessels are not obliged to pass nearer to Martin Garcia than 1½ m.; thus taking from this island the perfect command it formerly had over the entrance to the rivers Paraná and Uruguay."

M. Francis de Castelnau continues the publication of his important journey in South America.

M. Delaporte has published an account of his journey in the country of the Araucanians.

Benjamin Vicuña Mackenna has reported upon the agriculture of Chile and upon European migration to that country.

M. Isambert and M. de Angelis, and Lieut. Maury, U.S.N., have written upon the free navigation of the Amazon.

AUSTRALIA.

By far the most important information we have had communicated to us with regard to this country is the progress which has been made by the North Australian Expedition under Mr. Augustus Gregory.

From this enterprising explorer, whose exploits in Western Australia are well known, by a letter communicated through the Colonial Office, we learn that the Expedition left Moreton Island on 13th September, 1855, in the ship 'Monarch' and the 'Tom Tough' schooner, and after nearly encountering shipwreck at the entrance of Port Patterson, was landed at Point Pearce.

At the time of the last despatch the stock had suffered from the voyage, and the horses were in a weak condition; but the Expedition was in all other respects in an efficient state, and the officers and men were all in good health and full of ardour. The horses having been landed from the ship, were to proceed round the head of the Fitzmaurice, making their way to the Kangaroo Point in Victoria River, whence the Expedition would take its final departure for the interior. No natives had been seen, but it was evident by many fires and other traces that they were numerous on that part of the coast. Through Sir Roderick Murchison some information has been received from Mr. Wilson, the geologist to the Expedition; and Mr. Baines, the artist, has illustrated the country about Moreton Bay by the sketches which have been laid on our table.

The importance of this Expedition in opening out to our knowledge the interior of the northern portion of Australia, in bringing us acquainted with the physical and geographical features of the country, by which we may hope to forward the progress of that most important and desirable object, the settlement of this portion of the continent; the determination of the watersheds of those important rivers, the Victoria and Albert, supposed to have their rise in an extensive range of mountains in the locality to be explored, and of the facilities or otherwise of connecting Carpentaria with the southern ports, by which the dangerous navigation of the coast and of Torres Strait and the delays from monsoons will be avoided;—the importance, I say, of all this information, which we may expect to derive from this Expedition, cannot be too highly estimated, whether as regards the welfare of the people, or the vast interests which are involved in this country, with respect to that portion of our colonies.

I cannot quit the subject of this Expedition without mentioning an instance of rare liberality in the cause of geographical science which was communicated at one of our evening meetings, during this session, by Count Strzelecki. When the North Australian Expedition was first planned, and when, owing to the length of time which had elapsed before it started, it was supposed that funds were wanting to carry it out, an associate of this Society, Mr. M. Uzielli, generously offered to place the munificent sum of 10,000*l.* at its disposal. Another of our Associates, Mr. W. S. Lindsay, M.P., had also previously offered to contribute largely towards the outfit of the Expedition. As, however, the Government have taken the matter into their own hands, these gentlemen have not been called upon to fulfil their promises; but we must still look upon the offers as proofs, that the labours of the Geographical Society are fully appreciated by practical men, and of the zeal that exists among us for the advancement of geographical knowledge.

In connection with this part of my subject, I next mention a paper by our Associate Captain Stokes of the Royal Navy, on steam communication between our settlements in Australia and this country, India, and China, and on the establishment of a Penal Settlement in connection with a colony in the vicinity of the Gulf of Carpentaria. In this he proposes a new route through Torres Strait, and to render its various passages safe by the erection of lighthouses and the establishment of pilots.

The necessity for improving the navigation of Torres Strait was some months ago brought prominently forward by the great body of the shipping interests in Australia, in a memorial transmitted to this country, and communicated to Lloyd's; and there can be no doubt that the vast interests involved, demand our serious attention; for whether or not the proposed means of communication ultimately become the direct routes to and from those colonies, Torres Strait will still remain the high road of communication between India and the South Pacific Ocean, and between our Southern Australian colonies, India, and China.

New Caledonia.—From the 'Annales de la Marine et des Colonies,' we learn that the French have made a complete investigation of New Caledonia, and have taken possession of the whole island, and caused the sovereignty of France to be acknowledged.

The loss of a Chinese junk upon D'Entrecasteaux Reef, New Caledonia, has been the occasion of bringing us better acquainted with that most dangerous reef, and with its vast extent and correct geographical position, by Lieutenant Chimmo, R.N., and with its formation and natural history by Dr. McDonald, the assistant-surgeon of H.M.S. 'Torch,' under Lieutenant Chimmo's command.

Norfolk Island.—You will have learned from our 'Proceedings' that Norfolk Island, in a complete state of preparation, and with all its buildings, has been appropriated to the use of the Pitcairn Islanders, who have all consented to be transferred there. The planting a colony consisting of persons of such exemplary moral conduct, and of such uniform piety, may perhaps exercise a beneficial effect upon the other islands of the Pacific within their influence.

Bonin Isles.—The Bonin Islands have obtained some notoriety lately, from the mention which has been made of them by Commodore Perry of the United States' Navy, who considers them to be of great importance from their geographical position, and that they may be looked upon as offering to a maritime nation a most "valuable acquisition." In an early stage of the question this officer claimed them as the property of the United States, under the impression that the group had been visited by an American citizen before the islands were formally taken possession of by myself in 1827. But having since learned from the Address of our late President, the Earl of Ellesmere, that the individual in right of whom he claimed them, was an Englishman, he has generously acknowledged that he was probably misinformed. And here I would leave the matter, except that I think it due to myself to reply to his remark, "that in naming these islands I had very unjustly overlooked the name of Coffin, who had visited the southern part of the group before I had." To this I have only to plead entire ignorance of Captain Coffin ever having visited these islands at all, until I read the remarks of Commodore Perry. The right of possession from priority of discovery is a question of which nations are naturally jealous; but I trust that not only in respect of these islands, but in all other cases, our relations will be such, that our ports will be mutually open for the general benefit of navigation and commerce.

NEW PUBLICATIONS.

Numerous donations have been presented to the Society, including 4 atlases, upwards of 350 maps and charts, and 663 volumes and pamphlets; affording an excellent proof of the desire to bring its members acquainted with the publications of the day, and denoting a sense of the Society's usefulness. A complete list of these will be printed as usual in the Journal, and many have been specially alluded to in the course of the Address. Among the donations contributed by our own countrymen, though not at present associated with us, may be mentioned the learned work on the Chinese and their Rebellions, by Mr. Meadows, which will receive further notice in the 'Proceedings.'

Our associate, Mr. Alexander Keith Johnston, has completed the new edition of his superb Physical Atlas. The publication of the first edition of this great work, ten years since, had the effect of introducing in this country almost a new era in the popular study of geography, through its attractive and instructive illustration of the prominent features of the science. This second edition is to some extent an entirely new work, owing to the additions and improvements which have been introduced. I have only to refer to the names of Murchison, Forbes, Brewster, Ami Boué, and Berghaus, to stamp the high character of the work; but I must not omit to mention, among new contributions, the Geological Map of Europe, by Sir Roderick Murchison and Professor Nicol; that of America, by Professor Rogers; General Sabine's Map of Terrestrial Magnetism; the Distribution of Marine Animals, by the lamented Professor Edward Forbes; and the addition of a large general Index adds materially to the utility of this extensive compendium of Natural Geography.

The Imperial Atlas of Modern Geography, edited by our associate, Dr. Blackie, of Glasgow, has reached its twelfth number. The maps are very neatly and correctly executed by some of our best cartographers.

The Royal Illustrated Atlas, with an introductory notice on the existing literature of geography, by Dr. Shaw, is also in course of publication by Messrs. Fullarton, and has reached its eighth part. The design of this atlas goes beyond the ordinary scope of unadorned cartography, in combining with the maps, picturesque vignettes and illustrations of the countries and their inhabitants. The maps are prettily drawn according to the latest authorities, and the pictures, which form an unusual, though instructive feature of the work, are neatly engraved.

I may include in this notice of our own labours, a beautiful Map of Madeira, published in London, in the English language, and dedicated, by permission, to this Society, by our Corresponding member M. Ziegler of Winterthur. The physical features of this island, including the distribution of its vegetation, are skilfully portrayed; and in addition to his own observations, Mr. Ziegler acknowledges the assistance he has derived from the labours of Captain Vidal, R.N., and Sir Charles Lyell; and especially from the communications of Mr. Hartung, whose portfolios are rich with the researches of six winters. Such a map cannot fail to prove valuable to the geographer, and an interesting companion to those who seek in Madeira, for a milder climate than our own.

The successful researches which have been prosecuted among the mounds of Mesopotamia have led to the production of a series of three beautiful Maps for the Government of India, by Commander Jones, I.N., delineating the remains of Khorsabad, Nineveh, Selamiyeh, and Nimrud.

One of the latest communications received from our lamented Corresponding member, Vicomte de Santarem, contained the donation of a copy of the fac-simile published by the Vicomte of the large Map of the World drawn by Fra Mauro in 1459. This fac-simile is of the same size as the original, and published on six sheets.

Among our members who have contributed to Crimean geography may be now mentioned Mr. G. Cavendish Taylor, who has recently published a Journal of Adventures with the British Army, in two volumes.

One of our earliest members, General Monteith, whose Map of Georgia and the Caucasus was engraved several years since by the Society, and still remains in repute, has lately published a volume on Kars and Erzeroum, with an account of the Campaigns of Prince Paskiewitch and of the Russian Conquests beyond the Caucasus.

Mr. William Ferguson, our associate, has published his journal of a visit, entitled 'America by River and Rail, or Notes by the Way on the New World and its People.'

Dr. J. D. Hooker and our associate Dr. Thompson have published, separately, their Introductory Essay to the Flora Indica, including outlines of the Physical Geography and Botany of the Provinces of India.

A fine Map has been published lately by Mr. Stanford, containing the eastern frontier of the Cape of Good Hope, drawn by Mr. Henry Hall, of the Ordnance department in that colony, whose merits as a cartographer are well known. This map appears very opportunely, as it includes the country of the Bassutos, where disturbances are apprehended. Mr. Stanford has also presented a copy of the new edition of Baily's Map of Central America, with corrections from the recent surveys of Squier, Codazzi, and others.

Capt. Burton has completed the narrative of his dangerous journey to Mecca and Medina, in the disguise of an Affghan pilgrim; and he has also published an account of his visit to the African city of Harar, which had been deemed inaccessible, owing to the savage and hostile character of the chief, as well as of the people.

Our associate, Captain Charles F. A. Shadwell, R.N., C.B., has added to his useful publications on navigation a case containing, on a dozen cards, 'Formulæ of Navigation and Nautical Astronomy;' also another work on the Management of Chronometers.

The labours of other Members have been alluded to in various parts of this Address in connection with the different countries to which they relate.

PHYSICAL GEOGRAPHY.

During the past year there has appeared, under the direction of the zealous superintendent of the Ordnance Survey, an abstract of the operations, carried on in Ireland, for the purpose of referring the mean water levels upon various parts of the coast to a common standard. Although these observations have long been discussed by our Astronomer Royal, and will be found in the Transactions of the Royal Society, yet it is only now that the complete details of the operations have been published; and as the observations present this curious result, viz. that the mean sea level is higher upon the northern part of Ireland than upon the southern part, and as no notice of this has ever appeared in our Journal that I am aware of, I take this occasion of observing that, if we take as the standard Courtown, in Wicklow—a spot remarkable as having no perceptible rise or fall of its tide, and about midway on the axis of the great tidal wave between the extremities of Ireland—we shall find that the mean sea level stands higher on the north of Ireland (Ballycastle) by 0·881 feet and lower on the south (Castle Townsend) by 0·938 feet than it does at Courtown. I know it will be interesting to many of our Associates to have these facts inserted in their Journal.

Of late, various papers have appeared on the circulation of the waters of the ocean; and as new facts are received, the interest of the subject increases. The labours of America have in this respect been very fruitful; Lieutenant Maury, our able and newly elected Corresponding member, has laboured deeply in this field, and has shown us with what accuracy he has determined the course and velocity of the Gulf Stream, by the remarkable agreement between the real and calculated position in which the unfortunate 'San Francisco' was found, after being disabled and drifting many days in the strength of the current.

The American Surveying Expedition, under Lieutenant Lee, has also contributed to the subject; and, while pursuing its observations upon the streams of the ocean, has largely added to our store of ocean temperatures at various depths, and has furnished us with a most interesting section of the basin of the Atlantic, which will throw considerable light upon the practicability of the project of connecting the two great continents of Europe and America by a telegraphic wire.

Mr. Findlay, our Associate, has added to his former contributions on the subject of ocean streams; and Captain Irminger, of the Danish Royal Navy, has supplied us with information as to a new course of the stream on the coast of Greenland.

It has been the practice of my predecessors to notice the progress of magnetic science from the natural connection between the compass and topographical operations. During the past year a committee has been formed at Liverpool for the purpose of inquiring into that subtle subject, the disturbance of the compass in iron vessels. They have made a report of their labours, up to the end of the year, to the Board of Trade, which presents some curious and interesting results, and they are still continuing their investigations. The Board of Trade encourages this inquiry, so manifestly advantageous to the shipping interest, by an annual grant of money.

The question of local attraction in ships has also engaged the attention of our learned and indefatigable Astronomer-Royal, who has recently furnished a valuable paper on the subject to the Royal Society.

Various papers on this subject by other authors also have been published since the last anniversary, of which some have been read before the British Association at Glasgow, particularly those by Dr. Scoresby, and by Mr. Towson.

It will be interesting to know that Mr. Piazzi Smyth, the Astronomer-Royal at Edinburgh, is about to proceed to Teneriffe, to make astronomical observations on the summit of the famed Peak of Teyde.

The distinguished author of the 'Law of Storms,' Sir William Reid, has published a notice of the motion of winds and storms in the Mediterranean, and drawn a comparison between the gales and forces of the winds of Malta and of Bermuda. The work embodies a memorandum by our valued associate, Captain Graves, R.N., on the advantages which shipping will derive from pursuing a certain course in the Mediterranean, with respect to prevailing winds at certain seasons of the year.

I am happy to be able to announce the completion of an important series of observations upon the tidal streams of the seas around our own shores, which have been carried on for several years in a small vessel, which the Admiralty liberally placed at my disposal. These observations are of great importance as regards this particular branch of science, as they satisfactorily establish, in tidal waves of a peculiar character, the existence of a simultaneous turn of stream throughout the wave, notwithstanding the remarkable fact of there being a progressively increasing tidal establishment. This theory was advocated in two papers under my own hand, printed in the 'Transactions' of the Royal Society; and it has now been further confirmed by numerous observations. The result will facilitate and simplify the navigation of our channels, and will affect much that has been written upon the subject of tides.

In connection with this branch of physics, I mention a work by Mr. F. A. Keller, an able hydrographical engineer of the French navy, entitled, 'Exposé du Régime des Courants dans la Manche et la Mer Allemagne.' The author has endeavoured to arrange the results derived from the first series of the observations, published, as before mentioned, in the Philosophical Transactions, in a manner which, he is of opinion, will render them more generally useful to mariners.

Lieutenant Maury has furnished a pamphlet on 'Lanes for Steamers,' or upon the routes which he would have steamers follow, when passing between England and America, in order to render this much frequented route more safe, by diminishing the chance of collision. In addition to lessening the danger of these passages, Lieutenant Maury points out several other advantages which would attend the adoption of his plan, and gives much useful information on the course of the Gulf Stream, as well as on districts where fogs and gales are most frequent, and the times when they most prevail.

Conclusion.

I have now laid before you as much of the general outline of the state and progress of Geographical science during the past year, as may be conveniently comprised within the limits of an Address, and I feel satisfied that there is much upon which the Society may be congratulated. The numerous communications made to the Society during the Session from all parts of the globe—the animated and enlightened discussions upon them, which are recorded in our useful periodical, the 'Proceedings,' which has been so successfully started, and the enlarged dimensions which our Journal has attained under the careful editorship of our zealous Secretary, Dr. Norton Shaw—are proofs of the many and fruitful sources whence information flows to us; and when we recollect how few of our evening meetings have been passed within these walls without some positive addition to the science we cultivate, we shall be able to comprehend the progress that is continually being made in Geographical research, and the great increase of the general interest which it excites. But it is not in the pages of our records alone, that the full benefits of the Society are seen—the mere facts added, year by year, to our store of knowledge, are but the promise of the successes before us, and of benefits to be derived from our labours. It is impossible to read the list of names enrolled as members of this Society without feeling convinced that its labours are considered valuable to every interest and to men of all professions; for it is not the geographer alone who will be found thus supporting our efforts: side by side with him stand the politician and the merchant, who regard with deep interest new enterprises opened out for commerce; and next to him the divine, who foresees in the extension of our science, fresh means of spreading the blessings of Christianity, and its attendant, the civilization of man. And so I might pass on to other professions, all concurring in the same sentiments and interests. In this union of views we cannot but foresee the enlarged success of the Society; and feel that it is with no exaggerated hopes we may look forward to its steady and satisfactory progress, and to its increasing importance and usefulness.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1856–7.

First Meeting, Nov. 10, 1856.

REAR-ADMIRAL F. W. BEECHEY, PRESIDENT, in the Chair.

ELECTIONS.—*Capt. Cole; Colonel the Hon. A. H. Gordon,* C.B.; *Sir Charles Nicholson; Commander Montagu F. O'Reilly,* R.N.; *and W. P. Andrew; J. Entwistle; G. K. Fairholme; J. B. Heath; W. H. Hovell; A. Hodgson; and William Staniland, Esqrs., were elected Fellows.*

DONATIONS.—Among the more important donations presented to the Society, since the last meeting, were the Ordnance Maps of England and Wales, so far as published, on the scale of one inch to a mile; also the Ordnance Maps of Lancashire, Edinburghshire, Haddingtonshire, Kirkcudbrightshire, Lewis Island in Ross-shire, and Wigtonshire, all on the six-inch scale; Admiralty Charts; Robinson's 'Biblical Researches;' Commodore Perry's 'Narrative of an Expedition to the China Seas and Japan,' *etc.;* Fullarton's 'Gazetteer of the World;' Quartermaster-General's Map of the S.W. Crimea; Crawfurd's 'Dictionary of the Indian Islands;' Lighthouse Map of the British Isles by the Board of Trade; Burton's 'Harar;' Sir R. McClure's 'Discovery of the North-West Passage' by Sherard Osborn; Becher's 'Landfall of Columbus;' Fleming's 'Southern Africa;' Charts of the French 'Dépôt de la Marine;' Hughes's 'Geography;' Maps of Ireland and of Scotland, from Mr. Stanford; Transactions of various Societies, *etc.*

ANNOUNCEMENTS.—The PRESIDENT announced to the Meeting that since they last separated, the Expedition to Eastern Africa had been despatched under the command of Captain Richard F. Burton, who, he hoped, would be joined at Bombay by an officer of the Indian Navy, and at Zanzibar by the Church Missionary, Mr. Rebmann. From the enterprising character and experience of these individuals, the most favourable results might be expected.

Despatches had also been received from Dr. Livingston, announcing his arrival at Tete, and subsequently at the Mauritius, after the successful and unprecedented journey across the continent of Africa, from west to east. The President paid a high compliment to this enterprising traveller, and as he was shortly expected in England, he had postponed the reading of his papers until the Society should have the advantage of his presence.

The President next adverted to the offer which had been made by Dr. Baikie, F.R.G.S., to ascend the Niger, and as there was reason to expect this enterprise would shortly be undertaken, he would ask Sir Roderick Murchison to say how it stood at present.

Sir Roderick Murchison said that it would be very gratifying to the Geographical Society to learn that Lord Clarendon had, from the first, expressed his desire to promote the expedition in every way; and he hoped it might soon be authoritatively announced to the Society, that the expedition would have the support of her Majesty's Government, and be conducted by the same officer who had led the former expedition up the Chadda.

The President then addressed the Society upon the subject of a letter, which the Secretary had received from that distinguished Arctic traveller, Dr. E. K. Kane, who had expressed deep regret at being prevented by illness from being present at the Meeting. The President had deferred answering this letter in the ordinary routine, as it afforded an opportunity which he was sure the Meeting would wish to avail themselves of—that of communicating to Dr. Kane, their sentiments on the occasion.

Sir Roderick Murchison said, that with the permission of the President he would make a motion to that effect. It had always been their custom to welcome travellers of distinction to this country, but he was sure that on no occasion whatever, had any traveller from another land come to England, who had done so much to advance an object that was dear to Britain; who had gone so far to rescue the lives of persons in a great expedition, in which they, as geographers, had a great interest. There was no person who had ever come to this country, who ought to be received with a warmer welcome than Dr. Kane. His energies had been directed towards the attainment of an object in a manner which had called forth the approbation of every man of science, who had attended to the progress of his search, and read the remarkable book he had recently published. Dr. Kane had gone farther to the north than any Arctic explorer except Parry; and when he said that this remarkable man came with the intention of assisting Lady Franklin, in the endeavour to carry out by his own enterprise, the object that was at the heart of that noble-minded woman, and that he was prevented from doing so, by illness alone — when he said this, he was sure Dr. Kane was entitled to the additional sympathy of all the geographers there present. Therefore he was proud to be the person who should make the motion; and without occupying more of their time he would read the Resolution :—

"That, on the occasion of the arrival in this country of the eminent Arctic explorer, Dr. E. K. Kane, of the United States,—who, for his arduous and zealous endeavours, under the auspices of Messrs. Grinnell and Peabody, to rescue Franklin, and the important additions he had made to geographical knowledge, had received the Gold Medal of the Society :—the President do communicate on the part of the Fellows, the expression of their sincere regret, upon learning that this distinguished man should have been prevented by ill health, from appearing at this meeting, to receive the unanimous and hearty welcome which awaited him."

Captain Sherard Osborn, r.n., c.b., begged to second the motion. He ventured to do so, as one conversant with Arctic matters, and having examined Dr. Kane's reports, he was sure that never did Arctic traveller go through more extraordinary trials, or meet them with more courage and energy.

The President heartily concurred in the motion. He hardly knew whether to admire more in Dr. Kane, his great enterprise and perseverance, or his extraordinary modesty and generosity; but that he possessed these qualities, and everything that would fit him for a traveller, there could be no question. He deeply regretted that indisposition prevented Dr. Kane from following up the course which he had so successfully begun.

The resolution, having been put to the Meeting, was unanimously passed, amidst an expression of general sympathy.

The following papers were then read :—

1. *Report of the Progress of the North Australian Expedition.* By Mr. A. C. Gregory.

Communicated by the Right Hon. H. Labouchere, Colonial Office.

Victoria River, 14th June, 1856.

Sir,—Circumstances having arisen which render it necessary that the vessel, attached to the North Australian Expedition, should proceed to Timor for supplies, I avail myself of the opportunity to transmit a brief account of the operations of the Expedition to the present time, and its prospective movements.

In my letter of the 23rd September, 1855, I detailed the proceedings of the Expedition to that date, the 'Monarch' sailing the next morning.*

Having organized a party to proceed by land with the horses to the upper part of the Victoria, consisting of myself, Mr. H. Gregory, Dr. Müller, Overseer Phibbs, and six men, the remainder of the party embarked in the 'Tom Tough' schooner, to which the sheep had been removed from the 'Monarch,' Mr. Wilson being instructed to ascend the Victoria and form a camp at some suitable spot for disembarking the sheep, if practicable, near Kangaroo Point; and in accordance, the schooner sailed from Point Pearce on the 25th September.

On the 28th, I started from the camp at Providence Hill with the horses, which had been reduced to forty-one, and many of these scarcely able to travel, pursuing an easterly course through level forest country of indifferent quality, till the 3rd October, when we ascended MacAdam Range, which proved to be only the deeply serrated edge of the vast sandstone table-land, which occupies so much of this N.W. coast of Australia.

On the 4th October, one of the horses was seized with sudden illness, and died in four hours; and on the 10th, a second horse was lost under similar circumstances.

On the 11th, the party reached the Fitzmaurice River and camped on a small dry creek; but the tide rising in the night, the alligators ascended the creek from the river and attacked the horses which were feeding on the land, severely wounding three. On the same day a horse had been abandoned, being too weak to travel.

Crossing the Fitzmaurice on the 13th, at the lowest point at which it was fordable—the water being fresh, 20 yards wide and 2 feet deep, with a rapid current—we steered southward, and traversed some fine grassy valleys during this day; but soon reaching the stony hills beyond, we were compelled to leave two more horses, as they were completely exhausted, having been for some days so weak that they could not rise without assistance.

The country now became more rocky, so that we did not reach the banks of the Victoria till the 18th, when after a difficult descent from Sea Range, we camped, one mile north of the "Dome."

The two following days were occupied in travelling up the Victoria, the distance being greatly increased by having to head a deep salt-water creek, which joined the river opposite Kangaroo Point. On the 20th we reached the camp, which had been established by the party from the schooner, on the left bank of the river, in lat. 15° 34′ S.

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* *See* Proceedings, No. I., p. 5; No. II., p. 32, 33, 49; No. IV., p. 79.—Ed.

Here I learned that the schooner had got aground about eight miles below Curiosity Hill, on the 27th September, and had not yet been got afloat, though the tide had driven her over several banks; that she had sustained much injury, and leaked so much that a large quantity of the stores was damaged.

The following day I proceeded down the river in one of the boats, and reached the 'Tom Tough' on the 22nd.

The schooner had not moved for some days, and the leaks were in some degree lessened by nailing battens and tarred blankets over the seams, which had opened. Being bedded 4 feet in the sand, I could not examine her bottom, though the bank was dry at three-quarter ebb.

Several of the deck-beams were fractured, and there were many indications of her being much strained, by the tide having worked deep holes at the bow and stern, and then leaving her dry on a narrow bank amidships.

The tides were too low to float her till the 24th, after which every succeeding tide carried the vessel a short distance higher up the river, and on the 27th she cleared the banks and reached Sandy Island. On the 29th, she moored at the camp, where there was a convenient spot for discharging the cargo and repairing the vessel.

On examining the schooner, the keelson was found to be broken near the mainmast, three of the deck beams broken, and nearly all the knees which secure the deck much strained from their places. The buts of several of the planks were started, and much of the copper torn off.

There having been on several occasions, 3 feet of water in the vessel's hold, much of the cargo was damaged; more than half the bread, sugar, and other dry provisions belonging to the vessel being wholly destroyed. The stores belonging to the Expedition, from being more carefully packed, did not suffer so much; about half a ton of flour, the same quantity of rice, 3 cwt. of salt, and 8 cwt. of sugar being destroyed, besides which, many packages of stores were damaged by the water leaking through the deck.

The greatest loss, however, which the Expedition has sustained, is the large number of sheep which have perished, owing to the long destitution on board the schooner. Out of 161 sheep embarked at Point Pearce, only 44 reached the camp with sufficient vitality to recover.

The early part of November was devoted to erecting a store, and discharging cargo from the vessel, preparatory to repairing her.

This being the driest season of the year, the horses had not improved sufficiently in condition to fit them for work. On the 15th

I therefore attempted to ascend the river in the gutta-percha boat, but soon after passing "Palm Island" the dry banks became so extensive that I relinquished the attempt, and returned to the camp, the heat of the sun having so completely destroyed the waterproofed canvas, of which the boat was constructed, that it was scarcely kept afloat during the latter part of the return voyage.

A few showers of rain having somewhat refreshed the grass, the horses showed some improvement. I therefore selected seven of the strongest, and on the 24th proceeded up the Victoria with a party consisting of Mr. H. Gregory, Mr. Wilson, and Dr. Müller.

Leaving the river a short distance below "Steep Head" we made a detour to the southward, and traversing a fine grassy country which extended to Beagle Valley, struck the river a few miles above the highest point examined by Captain Stokes.

Following the river upwards, we passed to the east of FitzRoy Range, and entered a deep gorge or ravine, bounded by cliffs of sandstone from 50 to 300 feet high. Through this ravine the river wound, forming deep reaches, sometimes several miles in length, and only separated by narrow banks of shingle or rock. The average course being nearly south, we soon reached lat. 16° S., when the valley suddenly expanded into a vast plain covered with excellent grass. In this plain were several isolated hills of trap or basalt, the decomposition of which adds much to the fertility of the soil.

Having traced the Victoria to lat. 16° 26′ S., long. 131° 10′ E., we returned to the camp, which was reached on the 13th December.

During our absence, such of the men as could be spared from the general duties of the camp, had been employed in cutting timber for strengthening the frame of the schooner.

The wet season had now set in, and the surface of the country became so soft, that the horses could scarcely be collected together at the camp.

The rugged character of the precipitous sandstone ranges which intersect the country, and the boggy condition of the plains, combined with the fact that the greater part of the horses, suited for draught, had been comprised in the number of those who had died, precluding the employment of the drays, it became necessary to explore the country with packhorses. Accordingly a party was organised, consisting of Mr. H. Gregory, Mr. Baines, Dr. Müller, and Messrs. Flood, Phibbs, Bowman, Deane and Fahey, thirty packhorses, and six saddle-horses.

With this party I started on the 3rd January, 1856, to explore the interior, south of the Victoria.

The flooded state of the country near the Victoria, compelled us to traverse the rocky ranges to the westward of the river. The rugged nature of the country, the intense heat of the atmosphere, loaded with moisture, conjoined with the ordinary difficulties which attend exploration in a new country, rendered our progress extremely slow; many of the horses were lamed, though shod before starting, and two had died before we reached lat. 17° S.

I therefore selected a suitable spot for a depôt in lat. 17° 3′ S., long. 130° 35′ E., and on the 31st January proceeded with Mr. H. Gregory, Dr. Müller, and Charles Deane, seven pack and four saddle horses, leaving the remainder of the party in charge of Mr. Baines.

Steering a southerly course, on the 7th February we reached the southernmost waters of the Victoria in lat. 18° 12′, long. 130° 39′, and crossed the dividing ridge between the waters flowing to the N.W. coast and those which fall into the interior; the elevation by barometric measurement being only 1300 feet above the level of the sea.* Continuing our route we descended into a nearly level and depressed country, and struck a small water-course trending to the S.E. On its banks there was abundance of grass, and a little water was found in the deeper portions of the channel.

This creek was followed to lat. 18° 22′ S., long. 130° 49′ E., where it was lost on a wide grassy plain, surrounded by level sandy country covered with triodia and stunted trees.

On the 9th, lat. 18° 31′, long. 130° 44′, was attained, but further progress was evidently impracticable, as we had reached a sandy desert country extending far to the south, in which neither water nor grass existed, little or no rain having fallen during the wet season; to the south of the dividing ridge, the elevation of this point was 1000 feet above the sea.

I now determined on following the northern limits of this desert to the westward, in hope of finding some creek or river, which, descending from the ranges to the north, might enable us to cross or at least penetrate this inhospitable region. Keeping therefore to the west along the foot of the sandstone range, on the 13th we came to the head of a creek in lat. 18°, long. 130°. This creek first trended N.W., but soon turned to the S.W.

For the first hundred miles, the country on the right bank consisted of vast level plains of rich soil, covered with beautiful grass; but the left bank presented a striking contrast in its low sandstone ranges, producing little besides triodia and scrub-trees.

The country on both banks now changed gradually to a sandy desert, with low, barren sandstone hills, and long parallel ridges of red drifting sand, straight, equal in height, and with a direction exactly east and west. This desert country was not altogether destitute of vegetation, but thinly covered with triodia (the spinifex of Australian explorers), and a few scattered bushes of eucalyptus, acacia, and hakea.

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* *See* Capt. Stokes's remarks at p. 191.—Ed.

After following this stream-bed, which I named Sturt's Creek, for nearly 300 miles, its channel terminated in a series of dry salt lakes, which occupied the lower portion of a large depression in the desert, the centre being in lat. 20° 16′ S., long. 127° 35′ E., and 900 feet above sea-level.

No outlet for the waters of these lakes could be discovered, though carefully sought for, and the great height at which the inundations of the country had remained for considerable periods, was evident from the abundance of mussel shells which remained in their natural position, embedded in the soil 20 feet above the dry bed of the lake, and more than a mile beyond its ordinary limits.

Surrounded on all sides by a sandy desert, in which it was hopeless to look for water or grass, and deprived of these essentials which the creek had afforded in sufficient quantity to enable us to proceed thus far into this inhospitable region, it was useless to attempt to penetrate the country to the southward, and no alternative remained but to retrace our steps while it continued practicable; for as no regular rains had fallen in this part of the country for at least twelve months, our supply had been generally derived from small muddy puddles, which resulted from heavy thunder showers which had fallen in the early part of the month. Most of these water-holes had now dried up, and I am doubtful whether our horses could have performed the long stages between the remaining watering-places, had not the open character of the country enabled us to travel at night, and thus avoid the scorching rays of an intertropical sun.

On the 11th March, we commenced retracing our steps up Sturt's Creek, and on the 24th, having reached the head of the creek, struck off to the N.E. to avoid the waterless country traversed on the outward route. In lat. 17° 42′, long. 129° 58′, we crossed the dividing ridge between the northern and southern waters, the elevation being 1660 feet above the sea, and, descending into a valley, came on a small dry creek trending N.W. This we followed for 30 miles, and then steered E.N.E. for 50 miles, over level grassy country, destitute of water, and reached the depôt camp, in the valley of the Victoria, on the 28th, found the party in good health and the horses much improved in condition.

As the horses I had employed on the excursion into the interior required a few days' rest, I selected six from those at the depôt, and on the 2nd April, accompanied by Mr. H. Gregory, Mr. Baines, and John Fahey, proceeded to the eastward to examine the country in that direction. Traversing for 60 miles a splendid grassy country of trap formation, well watered by numerous creeks, we reached the eastern boundary of the valley of the Victoria, then turning northwards traced the river down to 16° 26', and connected this route with that in December, 1855. Returning to the depôt by a more direct route, we reached that camp on the 17th.

On the 21st, I broke up the depôt camp and proceeded towards the lower part of the Victoria river, examining such portions of the right bank as had not been previously traversed, in order to ascertain if any considerable tributaries joined from the eastward, and on the 9th May reached the main camp.

The party at the main camp were all in good health except Henry Richards, who had lost the use of his right hand from falling down among some sharp reeds, one of which had pierced his wrist. The crew of the 'Tom Tough' had not escaped so well. The carpenter, John Finlay, had died on the 22nd April, and three of the seamen had been left on shore at the camp, that they might be under the immediate medical care of Mr. Elsey, the schooner having been moved down the river on the 2nd April.

Although this great amount of sickness is, in some degree, attributable to the re-development of previous disease, yet it more directly results from the bad quality and improper description of the provisions with which the vessel is supplied, and it has been absolutely necessary to furnish provisions from the stores of the Expedition for the use of the schooner's crew, their only remaining provisions consisting of salt beef of indifferent quality, biscuit much damaged by cockroaches, and tea.

The 'Tom Tough' was now moored below the shoals at Musquito Flats, and had been so far repaired by the unceasing energy of Captain Gourlay, that she was nearly ready for sea; a strong frame having been fixed inside the timbers, the seams caulked, and the buts secured. She now only makes 10 inches water per diem, whereas that was previously the usual quantity per hour. Great credit is due to the captain for the manner in which this work has been performed, having done all the smith's work and much of the carpentry with his own hands.

It is now my intention to proceed with the exploration of the country towards the Gulf of Carpentaria, and I have accordingly instructed the master of the 'Tom Tough' to proceed to Coepang for supplies, and thence to the Albert River to co-operate with the land expedition.

The greatly reduced number of horses, and the impracticability of employing the drays for the conveyance of stores, have rendered necessary a modification in the manner and arrangement of the exploring parties, and on the present occasion I shall employ a party of seven persons, as it is desirable that the party should not be entirely dependent on the assistance of the vessel at the Albert River.

The remainder of the exploring party will proceed in the schooner to the Gulf of Carpentaria, and on the junction at the Albert River of the two sections of the Expedition, the party will be reorganised, and, if practicable, continue the overland route to Moreton Bay.

Enclosed I transmit a sketch * of the country traversed by the Expedition to the present time, and, as it may render it more intelligible, append a few remarks on the physical character of the country.

It may be considered to be a table-land of sandstone rising abruptly from the low land on the coast; it attains an average level of 700 feet on the banks of the Victoria in lat. 17° S.; 900 feet in lat. 16°; 1600 feet in lat. 18°, which is the maximum, as the country falls to 1300 in 19°, and 1100 feet in lat. 20°.

The upper bed of sandstone is about 300 feet thick, and rests on soft white, green, and red shales, which are superincumbent on a coarse cherty limestone, and jasper. Large tracts of these two upper strata have been removed, and left large valleys and plains through which the rivers run. South of lat. 16° 30′ trap or basalt has been poured out into these valleys and formed plains or table-topped hills, sometimes isolated, but more commonly grouped together.

The sandstone, by its decomposition, usually forms a poor sandy soil, but occasionally fine grassy plains. The limestones, which occupy large extents of the valleys, are generally covered with a light loamy soil, producing abundance of grass; but the richest soil results from the decomposition of the trap rocks, which are so largely developed in the upper valleys of the Victoria, that at a moderate computation, they occupy a million of acres. This, added to the good country on the head of Sturt Creek, the lower part of the Victoria, and the Fitzmaurice, would make an aggregate of three million acres of available grazing land, already traversed by the Expedition.

Except iron ore, which is frequent, minerals are rare, only few traces of copper and slight indications of coal being observed.

Of the vegetable productions, little favourable can be said, for however interesting many of the plants may be to the scientific

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* In the Map-room of the Society.—Ed.

botanist, yet, with the exception of the grasses, which are very numerous, there is scarcely a single vegetable production which can be rendered practically useful. Timber is scarce, the best growing near Point Pearce.

In conclusion, it gives me pleasure to record the ready co-operation and assistance I have experienced on the part of the officers, and the exemplary conduct of the men attached to the Expedition, and that, under circumstances of privation, which few, who have not experience, ever fully appreciate.

I have, &c.
(Signed) A. C. Gregory,
Commanding N. A. Expedition.

To his Excellency Col. Sir W. T. Denison, R.E., F.R.G.S., *&c.*,
Governor-General of Australia.

Mr. Merivale, F.R.G.S., said he would only detain the Meeting a moment while he stated one or two facts concerning the Expedition, which had been received by Her Majesty's Government, but too late for communication to the Society. They had been received from Mr. M'Lean, H. M. Consul at Surabaya, in a report dated Sept. 3rd last. The account which had been read, left Mr. Gregory intending to despatch his schooner, the 'Tom Tough,' for repairs to Timor. It appeared that the schooner went to Timor, and she arrived in such a condition that some of the men considered their lives were unsafe, and they insisted upon the vessel being taken to Surabaya. She was accordingly taken there, and, having been examined, it was said that she could have got back from Timor, but that having come so far, and having to return against a strong head-wind, she would require much repair. Mr. Baines, with great promptitude, obtained another vessel, an English schooner, the 'Messenger,' which was at Surabaya, and on the 30th of August he left that place for the Gulf of Carpentaria, hoping to meet Mr. Gregory on its shores. Mr. Baines, however, expressed considerable alarm lest he should arrive too late, and Mr. Gregory should be reduced to straits. He hoped that these fears might prove unfounded, for it was believed that supplies had been sent by Sir W. Denison from New South Wales in a vessel called the 'Torch,' which would probably reach the Gulf before Mr. Baines arrived.

Captain Stokes, F.R.G.S., said no one could listen to the despatch just read with greater interest than himself, as he was one of the party that first discovered and explored the Victoria. It appeared that Mr. Gregory had examined one branch of the Victoria about 350 miles; or twice the distance, roughly speaking, that it was explored by the 'Beagle's' party. About 100 miles below the source of this branch, there was another coming from the south-east, which only appeared to have been traced down some 20 miles; but Captain Stokes believed that it led more into the interior, and was of greater consequence than the branch which Mr. Gregory had followed.* No doubt his instructions carried him to the south-west, and he naturally took the branch that led in that direction. His further journey, about 350 miles to the south-west, was one of great geographical interest, inasmuch as it showed the north-west boundary of the desert and the limits of the area drained by the rivers west of the Victoria. His account of the red drift sand, so exactly corresponded with what Captain Sturt met with some 400 or 500 miles eastward, that they might conclude that the whole of the intervening country was of the same character—a sandy desert, impassable, and fatal to any hopes of overland communication between South Australia and the North-west Coast. In support of this idea, Captain Stokes referred to Mr. Austin's expedition from Western Australia, where, about the parallel 26½° and meridian 117°, he discovered the south-westerly boundary, evidently of the same sandy desert. It was an accumulation of lakes in rainy reasons, and of dry mud and arid sands in the hot seasons. Another indication of the extent of the desert, was the character of the central part of the North-west Coast, which Captain Stokes was the first to visit in the year 1841, when he was quite satisfied, from its singular resemblance to the Pampas of South America, that all within was a desert; and this would give a fair idea of its westerly limit. Going back to Mr. Gregory's exploration of the upper part of the Victoria, it appeared that he had met with a considerable extent of good country, which proved that the Victoria had not been overrated. Australia was, it was well known, deficient in navigable rivers, and when the Victoria was discovered and found navigable, it was regarded as an important stream; and, compared with the Murray in the south, it was called the great river of North Australia. The Victoria has this advantage over the Murray, that it always had a navigable entrance, while the mouth of the Murray was almost impassable. Mr. Gregory's discovery of so much good country on the Victoria, favoured the proposal to establish penal settlements in North Australia. He alluded to this, because the every-day police reports convinced him that the ticket-of-leave system was a failure, and transportation the only remedy. He would, in conclusion, express the hope that the same success would attend Mr. Gregory in the further and more important part of his expedition between the Victoria and the Albert. He should have much preferred that Mr. Gregory's instructions had confined him to tracing the chief sources of the Victoria, especially towards the south-east, and then proceeding eastwards to Carpentaria. If these had been his orders, what might have been the result? Instead of hearing of him still on the Victoria river, we would have heard of his arrival on the Albert.

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* *See* p. 187.—Ed.

The **President** said they were much indebted to Captain Stokes for his observations. When they remembered that Captain Stokes was present at the discovery of that river himself, and had traced it on foot for some distance inland, every word which fell from him must be of interest.

Mr. Latrobe, F.R.G.S., congratulated the Society upon the success which had thus far attended this effort. He considered that it had been conducted upon the only principles which could induce them to look for good results, and if, as Sir Roderick Murchison said, the expeditionary party hugged the coast, they might really hope for great results. As to the interior, it appeared now to be a perfect blank on the map; he was afraid it would remain so, and that they might write upon it "Sahara Australis."

The peculiar character of the winds which proceeded from the great N.W. interior to that part of New Holland with which he was acquainted, showed that this interior must be a desert—an arid waste, throwing off an intense heat in summer, and, during the period of the winter rains, originating a chilly wind, possessing many of the peculiar characteristics of the hot winds. Like these, it appeared to move on a plane parallel to the earth's surface. It exercised a similar influence upon vegetation, causing plants to droop and the leaves of the acacia to close, although the winds from southward, bringing with them a far greater degree of cold, might produce no such effect. He hoped that they would remain satisfied with the attempts already made to penetrate directly into the interior beyond the head waters of known streams, and not risk the loss of life and tempt the fate of Leichhardt.

Sir Roderick Murchison, in reply to a question of the President regarding the geology of North Australia, said he had little or no information to give respecting it, since no details had yet arrived. There were, indeed, a few observations in the despatch of Mr. Gregory, and portions of a letter he had received from Mr. Wilson, the gentleman selected as geologist of the expedition, which would at a future meeting, be brought before the Society. The success which had already attended the expedition was highly gratifying to him, for he was one of its earliest advocates when the Duke of Newcastle was in office; and it was that statesman who first gave attention to the representations of the Geographical Society on the subject. What had fallen from Captain Stokes explained very clearly that object of the expedition which was considered of the greatest importance, *i. e.* not merely to discover the extent of the great interior saline desert, or whether there might or might not be a practicable route from Northern to Southern Australia; but to determine first the true water-parting, and having ascertained the source of the Victoria, then without further delay to travel along that high-land, and proceed at once to the Gulf of Carpentaria before the resources of the expedition were exhausted. He should, therefore, exceedingly regret, in conjunction with Captain Stokes, if through the exhaustion of their resources the leading objects of the expedition were not attained, by opening out that great line of intercourse which he hoped to see established between Sydney on the south and the Gulf of Carpentaria on the north. He hoped, however, that Mr. Gregory would have ample provision to enable him to effect that object. They must, at all events, give that gentleman all credit for having overcome great difficulties, and for having already solved a curious geographical problem. If he should demonstrate the practicability of the other suggestion, he will have achieved a most important result.

2. *Notes of a Journey up the Sadong River, in North-West Borneo.*

By A. R. Wallace, F.R.G.S.*

The Sadong is the first considerable river east of Saráwak, from which it is distant about 25 miles, and forms a portion of the territory lately ceded in perpetuity by the Sultan of Borneo to Sir James Brooke.

About 20 miles up this river, a small stream, the Simunjon, enters from the east, a few miles up which, on an isolated mountain, coal of good quality has been discovered, and is now being worked. At this place I spent the whole of the dry season of 1855, engaged in making collections of birds and insects, and more particularly in hunting the great orang-utan or "mias," which is there particularly abundant. I succeeded in shooting 13 of these extraordinary animals, and in accumulating a mass of information about them, which will, I trust, tend to clear up many obscure and doubtful points in their natural history. I had intended to devote the latter part of the dry season to a somewhat extended journey into the interior, but an unfortunate wound in my foot rendered me incapable of leaving the house for three months of the very finest weather, and it was not till the rains had begun that I was enabled to walk. As the time which I had fixed for leaving Borneo, was now drawing near, I determined to return to Saráwak, by crossing the country between the head waters of the Sadong and Saráwak rivers; and as I am not aware of any account of this district or of its inhabitants having been published, or indeed of the whole of it having been previously visited by any European, I beg leave to submit my notes to the Royal Geographical Society.

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* *See* Proceedings, R. G. S., No. IV. p. 97.—Ed.

The whole of the lower part of the Sadong valley is a forest plain, with scarcely a single spot of dry ground, except where a few isolated hills rise abruptly from it. It is a vast morass of a black vegetable mud, resting on a yellow clay. The surface is as nearly as possible on a level with the sea at high water. In such a country it may be supposed that the lower part of the river is monotonous enough. The banks are cultivated as paddy fields by the Dyaks and Malays; and their little thatch huts alone break the unpicturesque line of muddy banks, crowned with tall grasses and sedges, and backed by the tops of the forest trees behind the cultivated ground. It took me a day and a half from the mines to reach the Malay village of Gudong, where I stayed an hour to make some purchases of fruit and provisions, and called upon the Datu Bandar, or Malay governor of the place. His house was very spacious, but very dirty both outside and in. He was particular in his inquiries about the coal, the use of which the natives cannot realize. They are besides quite puzzled at the extensive and costly preparations made for working it. At the village of Jahi I found the stream so swift on account of a slight flood, that my heavy boat could make no way against it, and I was obliged to remain a day to obtain a smaller one, and fresh men to take me up to the first village of Hill Dyaks.

I succeeded here in meeting with a Malay boy, named Bujon, who wanted to return to Saráwak, and agreed to accompany me, and who, as he knew the language of the Sadong Dyaks, having traded among them, was a very important acquisition. Leaving Jahi in a very small open boat, we proceeded more pleasantly, and in a few hours got beyond the cultivated country to where the virgin forests come down to the water's edge. At night we had some difficulty in finding dry ground to sleep on, the river's banks being generally flooded. Early in the morning we reached Empugnan, a small Malay village, situate at the foot of a mountain of the same name, which had been visible from the mouth of the Simunjon river, and is apparently isolated. In the dry season the tide reaches this place. From here the vegetation becomes much finer. Large trees stretch out their arms across the stream, and the high earthy banks are clothed with ferns and scitamineous plants.

Early in the afternoon we arrived at Tabokan, the first village of the Senankan Dyaks. On an open space near the river about twenty boys were playing at a game, something like what we call 'prisoner's base;' their ornaments of beads and brass wire, and their gay coloured kerchiefs and waist-cloths, showing to much advantage and forming a very pleasing sight. Being called by Bujon, they immediately left their game to carry my things up to the round head-house, which is attached to most Dyak houses, and serves as the lodging for strangers, the place for trade, the sleeping-room for the unmarried youths, and the general council-chamber. It is generally elevated on very lofty posts, has a large fireplace in the middle, and windows in the roof all round, and forms a very pleasant and comfortable abode. In the evening, after dusk, the house was crowded with young men and boys who came to look at me. They were mostly fine young fellows, and I could not help admiring the simplicity and elegance of their costume. Their only dress is the long "chawat" or waist-cloth, the ends of which hang down before and behind. It is generally of blue cotton, ending in broad bands of red, blue, and white. Those who can afford it, wear a handkerchief on the head, which is either red with a narrow border of gold lace, or red, blue, and white like the "chawat." The large, flat, moon-shaped brass earrings, the masses of white or black beads round the neck, brass rings on the arms and legs, and armlets formed of sections of a great, white conical shell, all serve to relieve and set off the pure reddish brown skin and jet black hair. Add to this the little pouch containing materials for betel-chewing, and a long slender knife, both invariably worn at the side, and you have the every-day dress of the young Dyak gentleman.

The "orang-kaya," or rich man, as the chief of the tribe is called, now came in with several of the older men; and the "*bitchára*," or council, commenced about getting me men to go on the next morning. As I could not understand a word of their language, which is very different from the Malay, I took no part in the proceedings, but was represented by my boy Bujon. A Chinese trader was in the house, and he too wanted men the next day; but, on his hinting the same to the orang-kaya, he was sternly told that a white man's business was now being discussed, and he must wait another day before his could be thought about.

The next morning we started in a boat, about 30 feet long and 2 feet 4 inches wide. At this point, the stream abruptly changes its character. Hitherto it had been deep and smooth, though swiftly flowing, and confined by steep banks covered with vegetation. Now it rushed and rippled over a pebbly, sandy, or rocky bed, here and there forming miniature cascades and rapids, and throwing up on one side or the other, extensive banks of finely-coloured pebbles. No paddling could make way against it, but the Dyaks with bamboo poles, propelled us along with great dexterity and swiftness, never losing their balance, though standing up and exerting much force in such a narrow and unsteady vessel. It was a brilliant day, and the cheerful exertions of the men, the rushing of the sparkling waters, with the bright and varied foliage, which, from either bank, stretched over our heads, produced an exhilarating sensation, which I had not felt since leaving the grander waters of South America.

Early in the afternoon we reached the village of Borotoi; and, though it would have been easy to reach the next one before the evening, I was obliged to stay, as my men wanted to return, and others could not possibly go on with me without the preliminary talking. Besides, a white man was too great a rarity to be allowed to escape, and their wives would never have forgiven them, if, when they returned from the fields, they found that such a curiosity had not been kept for their examination.

Walking out to a small hill near, cultivated as paddy fields, I had a fine view of the country, which was becoming quite hilly, and toward the south, mountainous. I took bearings and sketches of all that were visible, which much astonished the Dyaks, who accompanied me, and produced much conversation when we returned, with a request to exhibit the compass.

The next morning we proceeded as before; but the river had become so shallow and rapid, and the boats were all so small, that though I had nothing with me but a change of clothes and a gun, with the scantiest possible *batterie de cuisine*, two were required with five men to take me on. The rock, which appeared occasionally on the river's banks, was an indurated clay-slate, sometimes highly crystalline, and thrown up nearly vertical. To the right and left of us were isolated mountains, which I knew to be limestone by their peculiar outlines, and by the whiteness of the numerous precipices they presented, no doubt an extension to the eastward of the limestone of the Saráwak river. The river bed was a mass of pebbles, mostly pure white quartz, with, however, abundance of jasper and veined quartz, which often presented a beautiful appearance. It was only 10 in the morning when we arrived at Budw; and though there were plenty of people about, I could not induce them to allow me to go on to the next village, only three hours farther.

I walked out to the paddy fields, which are here very extensive, covering a number of the little hills and valleys into which the whole country seems broken up, and obtained a beautiful view of hills and mountains in every direction. In the evening the "orang-kaya" came in full dress (a spangled velvet jacket, but no trousers), and invited me over to his house, where he gave me a seat of honour, under a canopy of white calico and coloured handkerchiefs. The great verandah was crowded with people, and large plates of rice, with cooked and fresh eggs, were placed on the ground as presents for me.

The costume of the Dyaks on ordinary occasions, though scanty, is highly becoming, but when they attempt to make themselves extremely fine on state occasions, they only succeed in becoming ridiculous. *In civilized countries it is the same.*

The river was now so shallow, that boats could ascend only with much trouble: I therefore preferred walking to the next village, first presenting the orang-kaya with some tobacco and a pickle-bottle, which latter he greatly esteemed. I had expected to see the country in this walk, but the path lay almost entirely through thickets of bamboo, which here springs up wherever the forest has been cleared away. The Dyaks get two crops off the ground in succession—one of paddy and one of sugar-cane, maize, and vegetables. The ground then remains eight or ten years before it is again cultivated—and soon becomes covered with bamboos, or grasses and shrubs, which often arch over the path and shut out everything from the view. At half-past nine we reached the village of Senankan, where I was again obliged to remain the whole day, which I at length agreed to do on the promise of the orang-kaya that his men should take me through two other villages across to Senna, on the Upper Saráwak River. I therefore amused myself as I best could, by walking about to the high grounds near, to get views of the country round till the evening, when another public audience, with gifts of rice and eggs, and drinking of rice-beer, took place. These Dyaks cultivate much ground, and supply a good deal of rice to Saráwak. They are rich in gongs, brass trays, wire, silver coins, and all such articles in which a Dyak's wealth consists, and their women and children were all highly ornamented. Here, as among most uncivilized people, there seems no gradual transition in the women between youth and age. From the pleasing and often elegantly formed girl of twelve or fourteen, a very few years of married life and hard labour, transforms them into coarse middle-aged women.

In the morning, after waiting some time, and the men that were to accompany me not making their appearance, I sent for the orang-kaya, and found that both he and another head man had gone out for the day, and on inquiring the reason of this extraordinary proceeding, was informed that they could not persuade any of their men to go with me, as I afterwards found, because the journey was long and fatiguing. As I was determined to get on that day, I told the few men that remained, that the chiefs had behaved very badly, and I should acquaint the Rajah with their conduct, and that I insisted on proceeding at once. Every man present made some excuse, but after much trouble and two hours' delay, we succeeded in getting off. For the first few miles, our path lay over a country of a very singular character, cleared for paddy fields. It consisted of abrupt hills and valleys, very steep, but of very slight elevation, all terminating in sharp ridges and hillocks, with not a patch of level ground. It was a mountain region in miniature. After crossing the Kayan River, a fine stream, which is in fact a larger branch of the Sadong than the one I ascended, we were on the lower slopes of the Sebóran Mountain, and the path lay along a sharp ridge which led up to the mountain, and afforded an excellent view of the country round. The features were exactly those of the Himalaya in miniature, as described by Dr. Hooker, and might be considered as a natural model of some part of those vast mountains, on a scale of about one-tenth, thousands of feet being here represented by hundreds. I now found the source of the beautiful pebbles which had so pleased me all up the river. The slaty rocks had ceased, and all these mountains appeared to be a conglomerate sandstone, in some places a mere mass of pebbles cemented together. I ought to have known before that such a small stream could not produce such vast quantities of well-rounded fragments of quartz and agate. They had been produced in past ages by the action of some large continental stream, before the great island of Borneo had risen from the ocean.

About mid-day we reached the village of Menyerry, beautifully situated on a spur of the mountain, about 600 feet above the valley, and affording a delightful view of the mountain region of this part of Borneo. I here first got a view of the Penrhissen Mountain, at the head of the Saráwak River, and one of the highest, if not the highest in this district, rising probably to near 6000 feet above the sea-level. The Rowen Mountain to the south, seemed nearly equally lofty. It is situated near Sikyam, on a tributary of the Pontianak River; and in the same direction, but much more distant, appeared the lofty mountain Nutowan.

Descending from Menyerry we again crossed the Kayan, which bends round the foot of the spur; and ascended to the pass which separates the valleys of the Sadong and Saráwak Rivers, and forms the boundary of the Saráwak district. The height of this point must be about 2000 feet. The descent from here was very fine. A deep rocky stream rushed on each side of us, down to one of which we gradually descended over numerous bamboo bridges, over the gulleys, or along the faces of precipices. Some of these were several hundred feet long, and fifty or sixty feet high, a single smooth bamboo 3 inches in diameter forming the only pathway, and a very shaky handrail of the same material, rendering the passage almost as perilous as that of the aërial bridge by which the followers of the Prophet are said to enter paradise.

Late in the afternoon we reached Sodos, situated on a space between two streams, but so surrounded by fruit-trees that little could be seen of the country. We stayed here for the night, and found the house very spacious, clean, and comfortable, and the people very civil and obliging.

In the morning early, we continued our descent to Senna, along a fine valley, with mountains rising 2000 or 3000 feet on every side. The stream rapidly increased in size till, when we reached Senna, it had become as large as the Sadong, above Tabokan, with the same abundance of sand and pebbles. Here too, the upheaved slaty rock again appeared, with the same dip and direction as in the Sadong. At Senna, I remained for the day, as the river was now navigable for boats to Saráwak. An unexpected difficulty however presented itself. The Senna Dyaks had no boats, they did not know how to make them, and never used them. It seemed strange to see people living by the side of such a fine stream without making use of it; but I found that they were true mountaineers, who had only come down the valley about twenty years ago, and had not yet got into new habits.

The people of Menyerry and Sodos are all of the same tribe. They make excellent paths and bridges, and cultivate a great extent of mountain land. Their district has therefore a more pleasing and civilized appearance, than in those places where the people move about only in boats, and confine their cultivation to the banks of the streams.

With some difficulty, I hired a boat from a Malay trader, to take me down to the next village, and found three Dyaks who had been several times with Malays to Saráwak, and thought they could manage a boat very well. They were, however, very awkward, constantly running aground, knocking up against rocks, losing their balance, and almost upsetting themselves and the boat, offering a striking contrast to the consummate skill in boatwork of most other Dyaks. At length we came to a really dangerous rapid where boats were often lost, and the men, conscious of their incapacity, were afraid to go on. Some Malays, with a boat-load of rice, here overtook us, and, after passing down with great skill, kindly sent back one of their men to assist me. This he did very well, for my Dyaks, in the critical part of the passage, lost their balance, and had they been alone, would certainly have upset the boat. The river was exceedingly picturesque, the ground on each side being cleared at intervals for paddy-fields, affording a view of the country. Numerous little farm-houses were built high up in trees overhanging the river. They were reached from the bank by a bamboo bridge, and had a most curious appearance. At intervals, too, were hanging bridges crossing the stream, and suspended from trees on either side. One of them is well figured in Mr. Low's work on 'Saráwak.'

Reaching the village of the Sebungo Dyaks, I remained there that day, and the next proceeded to Saráwak, passing through a most beautiful country, where limestone mountains, with their fantastic forms, white precipices, and rich vegetation, shoot up on every side. In one of them is a cave which I visited, and which, except that it passes completely through the spur of a lofty mountain, offers nothing remarkable. The banks of the Saráwak river are everywhere covered with fruit-trees, the most numerous being the durian, a magnificent forest-tree, bearing a terrifically spiny fruit, the size of a melon, and which deserves to be ranked as the king of fruits. No tropical fruit, I have yet seen, can bear any comparison with it. They were ripe, and we enjoyed them to perfection.

I shall now proceed to a few general observations on the geography and geology of the country I passed through, and on the characteristics of its inhabitants.

Geography, &c.—Taking the latest map of Borneo as professing to represent the geography of the country, according to the best authorities, I will point out a few alterations which seem to me to be required. First then, the territory of Saráwak must be considerably extended; the boundary line passing rather south-east from Penrhissen Mountain, which exactly agrees in position with Mount Sebahu of the maps, and which will increase its area at least one-third. The mountain group at the head of the Saráwak and Sadong Rivers, is completely separated from the Cape Datu Mountain, which terminates in the Poey Mountain in lat. 1° 35′ N. South of this an extensive plain occurs, over which a fine view as far as the coast of Sambas, is obtained from the Serambo Mountain, near Saráwak. In the position occupied by Mount Raja on the map, *no hills exist*. Farther east, all the hills must be placed more to the south, and it seems probable from all the information I can obtain, that they soon cease altogether; a gently inclined divide, only, existing between the tributaries of the Batanglupar and those of the Kapuas or Pontianak River. The Linga River, the first branch of the Batanglupar from the south, flows through a flat and swampy country almost from its source, near the Klingkang Mountain; and the passage from the higher part of the Batanglupar to the great lakes of the Upper Kapuas, is described as being over a scarcely elevated, certainly not a mountainous country. I am inclined, therefore, to believe that the little mountain district, from which flow the Saráwak and Sadong Rivers on the north, and the Sikyam and Landak on the south side, forms the central nucleus of the north-western end of Borneo. These rivers, in their upper part, are true mountain streams, flowing swiftly over gravelly beds, or rushing over rocky ledges, and forming so many little rapids and falls, that we cannot put their descent at less than 25 to 30 feet a-mile, probably much more. Now, on the Sadong, more than 30 miles of the river has this character, while 20 more is a deep and swift-flowing stream. This would give an elevation of a thousand feet for the base of this mountain region, showing that it differs essentially in character from those mountains nearer the coast, which, though of equal elevation, rise abruptly from a flat and marshy country which is scarcely elevated above the level of the high tides.

Geology.—The geology of the country is exceedingly difficult to elucidate, owing to its great complication, to the difficulty of obtaining sections, and the excessive rarity of organic remains. In no case have I been able to ascertain, by direct observation, the order of superposition of any of the formations. The most extensive formation in the country is a ferruginous sandstone conglomerate. This composes most of the mountains near the coast, and also the whole of the central mountain region. Between these and often in contact with them, occur limestone and porphyritic or trappean rocks, and a hard slaty rock, which is sometimes highly crystalline. The sandstone rocks are generally inclined at an angle of from 7 to 20 degrees with the horizon, while the slaty rocks are always nearly vertical. No distinct stratification is observable in the limestone, which forms abrupt and fantastically formed isolated mountains, often presenting mural precipices of much grandeur, and it is in these that the *hirundo esculenta* forms the gelatinous nests, which are so great an article of luxury with the Chinese. On my sketch-map* the dip and direction of the strata are noted, wherever I observed them.

It is in the sandstone and the clayey beds which alternate with it, that the coal occurs, and there seems little reason to doubt that it is of the tertiary formation, as the most abundant fossils are impressions of exogenous foliage, exactly similar in character to that of the trees which now cover the surface. I have also seen what appear to be leguminous fruits, and the shells found in the Labuan coal-field, were all of an extremely recent type. Now as the sandstone of the interior almost exactly corresponds with that of the coal formation, we may conclude that it also is tertiary, the principal difference being, that some beds of it contain a greater quantity of quartz and limestone pebbles. The presence of volcanic rocks with contorted limestone, sufficiently explains the vertically-upheaved stratified rocks, which appear to underlay the sandstone. The limestone is highly crystalline, and is probably an ancient formation, as it contains slender-stemmed encrinites; and the slaty rocks which occur in all the river beds between the coal mountains and those of the interior, are probably of equal or greater antiquity. A considerable tract of country between the limestone hills, is covered with an alluvium of gravel and clays, the surface of which is very undulating, and in this the gold-washing is principally carried on. It seems to rest upon the limestone, which often pierces through it in strange water-worn peaks, which resemble ruined buildings, or ancient monuments. It is in cavities of the limestone also, that the antimony ore is found; and near the junction of the trap-rock with the limestone, a fine hot spring has recently been discovered.

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* In the Map-room of the Society.—Ed.

We may therefore, in general terms, describe the Saráwak district as consisting of ancient limestone and slaty rocks and of modern sandstone with coal. In the interval between these deposits, violent volcanic action has taken place, which has resulted in the trappean mountains; and this action has been renewed since the most recent rocks have been formed. With the very scanty information we yet possess on the subject, more detail than this would be out of place.

Ethnology.—The manners and customs of the Aborigines of Borneo have been so often described, that I shall only now make a few observations on what has been less generally noticed—their physical, mental, and moral characteristics. The Dyak is closely allied ethnographically to the Malay, more remotely to the Chinese and to the Indians of South America, who are all united by so many similarities, that we must consider them as branches of one great division of mankind, the Mongolian race. All are characterised by a reddish brown skin of various shades, by jet-black straight hair, by the scanty or totally absent beard, by the rather small and broad nose, and high cheek-bones. In one character only is there any disagreement among them;—in the Chinese and Tartar races the eyes are oblique, while in the Americans and Malays this peculiarity either does not exist, or is very slightly developed. The average stature of the Dyaks, seems intermediate between the Malays and Chinese, being rather greater than the former and less than the latter, though the local differences are in all very great. Their whole forms are well proportioned, their hands and feet small, and they are seldom so stout as either the Chinese or Malays, while the coronal region of the head, is better developed than in the latter races.

It is highly curious that countries so distant as Borneo and the valley of the Amazon, between which we can by no possibility imagine any direct communication to have ever taken place, should yet contain indigenes so similar to each other; for between some tribes of Dyaks and of Amazon Indians, I can call to mind no one physical distinction. We can only explain the circumstance by supposing both to have had a common origin, and shall thus have additional reason for supporting the views of Dr. Latham and others, who consider the Americans as Mongols who have emigrated direct from Eastern Asia. We may also suppose that similarity of climate and other physical conditions, have tended to produce the remarkable resemblance I have alluded to, both tribes inhabiting districts under the Equator, where the surface is everywhere covered with virgin forests, and where excessive heat and moisture constantly prevail.

In mental capacity it is probable that the Dyaks would be fully equal to the Malays or Chinese, while in moral character they are undoubtedly superior to either. They may be said to bear the same relation to the Malays, that the Tartars do to the Chinese. They are simple and honest, and become the prey of the Malay traders and chiefs, who cheat and oppress them whenever they have the opportunity. The Dyak languages are very various, and differ very considerably from each other. In some, nearly half the words are pure or modified Malay, while in others, there is scarcely a word exactly the same in the two languages. In some of the names of places, there is a strange similarity to the Celtic; thus, *Penrhissen*, *Lundu*, *Siniawen*, *Senna*, are most of them true Welsh names, and as the Celtic languages have an Eastern origin, and there is a considerable Sanscrit element in the Malay, and as besides there is reason to believe that Hindoos were once settled in Borneo, it seems possible that these are not mere accidental coincidences, but indications of a common origin of the former inhabitants or languages of Britain and Borneo—countries which we can now only place in juxtaposition, as representing nearly the extreme points on the scale of civilization.

Having compared the Dyaks with some of the indigenes of South America as to their physical characters, it may be as well to extend the comparison to their mental qualities as exhibited by their sports, their weapons, and their general habits. In these too there is a very considerable general resemblance, though much difference in the details. The Dyaks are more lively, more talkative, and less diffident than the Americans, and therefore pleasanter companions. They have more amusements and are more social, while at the same time they have less variety of weapons, and are less skilful in their methods of obtaining game and fish. Both these circumstances will lead us to place them one degree higher in the scale of civilization. Among the Indian boys of the Amazons, I never observed any other amusements, than imitations of the more serious occupations of the men. The bow and spear, the blowpipe or the canoe, were employed in their sports and games, which were thus the school in which they became qualified for the duties of manhood. This is a characteristic of the truly savage state. The Dyak youths, on the other hand, have their social games, their trials of strength and of skill. They amuse themselves with pegtops like our English schoolboys, and I was surprised to find them fully initiated in all the mysteries of the in-doors game of "scratch-cradle," of which they had modifications unknown to us. They possess besides numerous puzzles and tricks of great ingenuity, with which they amuse themselves on dull evenings or during wet weather. These apparently trifling matters are yet of some importance, in arriving at a true estimation of their social state. They show that these people have passed beyond that first stage of savage life, in which the struggle for existence absorbs their whole faculties, in which every thought and every idea is connected with war or hunting or the provision for their immediate necessities. It shows too an advanced capability of civilization, an aptitude to enjoy other than mere sensual pleasures, which, properly taken advantage of, may be of great use in an attempt to raise their social and mental condition.

The moral character of the Dyaks is undoubtedly high. They are truthful and honest to a remarkable degree. It is often impossible from this cause to get an opinion from them, for they say, "If I were to tell you what I don't know, I might tell a lie;" and if they relate any thing voluntarily, you may be sure that they are speaking the truth. The fruit-trees about their houses have each their owner, and it has often happened that on asking a Dyak to gather me some fruit from a tree, he has replied, "I can't do that, for the owner of the tree is not here;" never seeming to contemplate the possibility of acting otherwise. Neither will they take the smallest thing belonging to a European, without asking permission. They will pick up scraps of torn newspapers or crooked pins, and ask as a great favour whether they may have them. In other moral qualities they are also above most uncivilized, and perhaps also above most civilized, nations. They are temperate in food and drink, and the gross sensuality of the Chinese and Malays is unknown among them. They have but one fault—a fault common to all nations in a half-savage state, except perhaps the African races—an apathy and dilatoriness, which, however annoying to the Europeans who come into contact with them, cannot be considered a very grave offence, or be held to outbalance the many excellent qualities they possess.

Few subjects are of greater interest, or of more vital importance to the welfare of a people, than the state of the population, its increase or decrease, and the causes by which it is affected. In my visits to the Hill Dyaks, I was much struck by the apparent absence of those causes, which are generally supposed to check the increase of population, coupled with the evidence of a population almost stationary or very slightly increasing. The conditions generally supposed most favourable for the increase of population, are an abundance of food, the absence of polygamy, and early marriages. Here these conditions all exist. The people produce far more food than they consume, and exchange the surplus for ornaments, gongs, and small cannon, which constitute their wealth. On the whole, they appear remarkably free from disease; marriages take place early, though not too early, and old bachelors and old maids are alike unknown. The number of births is, however, below the usual ratio, and a sufficient cause may be found in the fatiguing occupations to which the women are subjected.

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3. *Proposed Exploration of Borneo.* By Lieut. C. A. C. De Crespigny, R.N., F.R.G.S.

Lieut. De Crespigny, R.N., submitted his proposition for the more thorough exploration of Borneo. He reasoned that Borneo ought to be better known, on account of its riches, its fertility, and above all, its position, situated as it is, in the direct route between China and Australia, between which two countries, it is not difficult to foresee, that there will be as great a trade as now exists between Europe and Australia. In addition to this, Lieut. De Crespigny was anxious to discover the ruins of a large stone city said to exist in Koti, in the east of Borneo, and the truth of a rumour of a tribe of fair people, living in the mountainous region of Kinibalu, with light hair and blue eyes. In reply to a question Lieut. De Crespigny said he had been employed in the survey of the north-west coast in 1848, and had taken that opportunity to learn the Malay language, and to gain information of the manners of the people.

He was of opinion that the character of both Malays and Dyaks had not been fairly reported upon. He knew them to be hospitable and honest, and did not think the Malays had a fault. The Dyaks certainly were addicted to taking heads, but upon the whole they were an inoffensive race, and he felt confident that he would be well received by them.

With regard to the means, he proposed that the Society should use their influence with the Admiralty, to have him placed upon full pay on the books of one of the guard-ships in this country, to provide him and his servant a passage to Labuan, and to lend him a few instruments and a small medicine-chest from their stores, and provide him with one or two other necessaries. Should this application fail, it would make no difference in his resolution, but it was absolutely necessary that he should be found a passage to Labuan.

He then pointed out the curious fact, that the north-west coast, which has been visited by so many of our ships, and which is the most important part of the country, is not known beyond a hundred yards in the jungle, with the exception of a few places, three of which, viz., Rejang, Bruni, and Tampanak, he had seen.*

The PRESIDENT said, when they considered the vast extent of country proposed to be traversed, no less than 600 miles in length and ten or eleven degrees of longitude in breadth, the nature of the climate and the reputed character of the natives—considering, too, that Lieutenant De Crespigny desired no assistance, no companions, that he intended to travel alone—he could not but admire his courage and enterprise. There was, besides, a further independence about this undertaking: the Lieutenant sought no aid from the Government or from that Society, or any Society, beyond that which the Admiralty might reasonably grant, which was, his full pay and a free passage to the site of his proposed adventures. When he looked at the vast extent of the route which he proposed to traverse, the opening out of a country said to abound in minerals and other valuable productions, and promising to be of great commercial importance, he could only hope that the project might be successfully carried out; that the Admiralty would listen to the proposal, and that the Society might have the happiness and advantage of reading in this room the relation of the successful performances of his enterprising and gallant friend.

MR. JOHN CRAWFURD, F.R.G.S., trusted that Lieutenant De Crespigny would have the support of that Society—he thoroughly deserved it; and that the Society would strongly recommend his case to the patronage of the Government. Previously to Mr. Wallace, whose journey had just been described to the Society, two travellers had already gone in among them, one from the north-west side, and the other from the south side—Mr. Dalton and Mr. Burns, a grandson of the poet. Borneo was nearly five times the extent of Great Britain, and nine times the extent of Ireland. It was inhabited by a rude people. There were upwards of 100 different tribes at the least; he had himself counted upwards of 50; and every one of these had a totally distinct and separate language. In fact in this respect, as well as in some others, Borneo far more resembled a huge block cut out of tropical America or tropical Africa, than any other country in the world. Now, as to its productions. It was not rich in vegetation useful to man. The island had, however, a great variety of valuable minerals. It is indeed the richest mineral country in the East. Its coal formations were most extensive, stretching right across from Bruni to Banjarmassin. Mines are worked at both extremities; by the English at the north-west, and by the Dutch at the south side. An English company, called the Eastern Archipelago Company, was mining upon an extensive scale, and had invested an immense sum of money, not less perhaps than 160,000*l*., consisting of steam-engines, pumps, and there was even a railway of a mile. It was expected soon to produce 60,000 tons of coals a-year. They knew the vast demand likely to arise for coal in connexion with our Eastern steam navigation. Iron was very abundant: he believed it to be a magnetic ore, from which the Dyaks are enabled to manufacture steel and iron superior to the best Swedish; at least it was so in the estimation of the natives, because they gave a higher price for it. Sulphuret of antimony was found in considerable abundance, more plentifully than in any other country. The history of the discovery of that mineral was curious enough. A gentleman of his acquaintance, like many other English gentlemen fond of scribbling in newspapers, wanted a subject to write about. He went to a bazaar for one, and found it in a mass of antimony. This was in 1823. A small portion of it was smelted to a regulus, and it turned out to be a sulphuret that had been brought from Saráwak; and most of the antimony we now import, 1500 tons annually, comes from that country. Sir James Brooke, by the aid of these antimony mines, was enabled to maintain the best government, native or European, ever established in Borneo. He had a population of nearly 30,000 under his authority, consisting of Dyaks and a great many other tribes; and considering what a strange, rude, anomalous population he has under him, it is certain he administers his government with eminent skill. Gold is produced in considerable quantities on the west coast. He believed there were 50,000 Chinese working the gold mines on the west coast, but they were much discouraged by the Dutch government. They produced about half a million pounds sterling annually, which is about one-thirtieth part of the produce of California or Australia, and that after they have been working there for a whole century. Diamonds were also produced. Among the vegetable productions was gutta percha, discovered by a relative of his in 1847. He saw small quantities of it employed in making knife-handles and horse-whips. Being in the medical profession, he thought that gutta percha would make very good splints and bougies, and he sent portions of it to Bengal, and those specimens are now in the East India House: that was the beginning. He received the gold medal of the Society of Arts; and the President of the India Board, at Mr. Crawfurd's request, had the kindness to confer upon his son a very handsome appointment in the service. From the returns of the Board of Trade, he saw that there had been imported of gutta percha, almost all from Borneo and Sumatra, not less than 23,000 cwts. With the assistance of this gutta percha, we knew what we were able to do; we shall be able, for example, to interchange conversation with our cousins across the Atlantic, in the course of a few months. There was another article of vegetable growth produced in Borneo that was curious enough—india-rubber, caoutchouc. Forty years ago, half a ton of india-rubber would serve Europe for ten years. The article was then used only for rubbing out pencil marks. The quantity now imported was 45,000 cwt. annually, and formed the raw material of a vast number of articles. The total value of it was 350,000*l*. Borneo produced sago, now become a considerable article. All these were things of modern discovery; and he had no doubt that Lieutenant De Crespigny, in the course of his journeys, would be able to discover a great many more. He possessed qualifications that well fitted him for the task he had undertaken; and he earnestly hoped, on the return of that gentleman, that they should be all present to hear his interesting papers read.

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* *See* preceding paper by Mr. Wallace.—ED.

The **President** said Mr. Crawfurd had given a very interesting and instructive description of the country which Lieut. De Crespigny was about to explore. He was sure all would join with Mr. Crawfurd in his hearty wishes for his success. The Council of the Society had expressed its desire that day that the Admiralty should be moved to grant Mr. De Crespigny's request. They could only hope that the Government would promote his views in every way, as he was sure the Society, judging from the expression of the sentiments of those present, would be disposed to do. Before the President adjourned, he directed the attention of the Meeting to an application of one of the many valuable productions of Borneo, in the shape of the gutta percha forming part of the submarine cable about to be stretched between this country and America; and adverted to the admirable section upon the walls of the room, of that part of the Atlantic in which the cable would lie, as delineated by Mr. Cyrus Field, from the survey of Lieutenant Berryman, of the U.S. Navy.

Second Meeting, Nov. 24, 1856.

SIR RODERICK I. MURCHISON, VICE-PRESIDENT, in the Chair.

Elections.—*Captain E. A. Acheson; Dr. Phil. H. Barth; Lieutenant L. Brine,* R.N.*; Captain W. Brook; Captain E. Cooper; and Messrs. J. W. Childers; J. A. Beaumont; J. D. C. Ewing; G. M. Harrison; A. B. Hill; J. R. Langler; J. Palliser; H. S. Reid; J. M. Share,* R.N.*; E. H. Stanley; J. L. Statham; and James Vaughan,* M.D.*, were elected Fellows.*

Donations.—Among donations received since the previous meeting were 'Le Moniteur des Indes, Orientales et Occidentales,' 3 vols. 4to., presented by Mr. J. Crawfurd, F.R.G.S.; Redhouse's 'English and Turkish Dictionary,' presented by Mr. Quaritch; 'Treasury of Geography,' by Mr. Wm. Hughes, F.R.G.S.; 'Series of Twelve Views in the Black Sea and the Bosphorus,' by Commander Montagu O'Reilly, R.N., F.R.G.S.; Reports of Explorations and Surveys in the United States; the Transactions of the Smithsonian Institution of Washington, of the Boston Society of Natural History, the German Oriental Society, the Imperial Geological Society of Vienna; the Royal Institute of Dutch India, &c.

Objects exhibited.—Various articles, relics of Sir John Franklin's expedition, obtained from the Esquimaux at Repulse Bay by Dr. Rae; and others, sent home by Mr. Anderson, from Montreal Island, were exhibited through the kindness of Mr. Tonna, F.R.G.S., Secretary of the United Service Institution, and excited much interest.

Announcements.—The **Chairman** stated that the members would be aware that, at their last meeting, a resolution was unanimously passed, to express their deep regret that their distinguished medallist, Dr. Kane, was prevented by illness from attending in person to receive those gratulations which they were all ready to offer him. The President of the Society, Admiral Beechey, who he regretted to say had been prevented by ill health from taking the chair, had requested him to state the gratification he had experienced in waiting upon Dr. Kane, and in expressing the feelings of admiration entertained by the Geographical Society towards that eminent traveller. The reply which Admiral Beechey received was as follows :—

Champion Hill, Camberwell, Nov. 16, 1856.

My dear Sir,—May I avail myself of your kindness to convey to the Society over which you preside, my sense of the high honour which, in the form of a resolution of welcome, was this day conveyed to me by you in person.

I regret that my extreme illness compels me to devolve this grateful duty upon another hand, but I know that you will make the necessary explanations to the Society.

I am, my dear Sir, with great regard,
Your obedient servant,
E. K. Kane, U.S. Navy.

Rear-Admiral F. W. Beechey, President R.G.S.

It was only necessary on his part to explain that Dr. Kane had, by order of his physicians, already proceeded on a voyage to the Havanna, and to add that it was no doubt the hearty wish of every British geographer that this distinguished man might be soon restored to health.

He, the Chairman, had also to announce that, since the last meeting, the Admiralty had acceded to the wish expressed by the President—a favour not granted on ordinary occasions—that Lieut. De Crespigny, F.R.G.S., the adventurous young officer who had volunteered to survey in various directions the extensive island of Borneo, should be allowed to proceed on the proposed expedition. The Admiralty received, it appears, the proposition very favourably, and had not only granted leave to Lieut. De Crespigny, but also a free passage in H.M.S. 'Actæon.' Upon the application of another naval officer, they were so liberal that they also granted permission to him to accompany Lieut. De Crespigny. He mentioned this circumstance with great satisfaction, as it showed that the Admiralty were fully aware of the position in public estimation which the Royal Geographical Society justly occupied. In fact, all the departments of the Government seemed anxious to attend to the recommendations and wishes of this Society.

He might further announce that the wishes of the deputation which waited upon the Earl of Clarendon, to urge his Lordship to sanction an annual expedition to the Niger and Chadda, like that successful one under Dr. Baikie, in order to bring us into systematic communication with the people of that portion of Africa, had met with the entire concurrence of her Majesty's Foreign Secretary. He felt confident, from what he heard on that occasion, that the Government would carry out the wishes, which had been long entertained by geographers. These were very gratifying results, and he need scarcely say the Society was flourishing, seeing so many new members added to it at every meeting.

The papers read were :—

1. *Plan for a farther Search after the Remains of the Franklin Expedition.*

By Lieut. Bedford Pim, R.N., F.R.G.S.

Lieut. Pim stated that as a decisive clue of the missing expedition had been obtained, in the shape of the relics purchased by Dr. Rae from the Esquimaux during his survey of part of Boothia, it was natural to look for the solution of the mystery to the locality of King William Land. He ascribed the failure of the last expedition sent out by the Hudson Bay Company to follow up the traces of Franklin discovered by Dr. Rae, to various causes, but chiefly to the lateness of the period of the year when they started and to the absence of an interpreter; and denied the existence of any evidence proving that the party had perished, since no vestige of human remains had been found, which would otherwise have been the case. The scheme he proposed was, that a screw steamer, with a complement of twenty men, should penetrate as far down Peel Sound as possible, take up winter quarters, and, assisted by teams of dogs, purchased at the Danish settlements of Greenland, extend the search down both sides of the Sound. Another steamer should push through Behring Strait and winter at King William Land; and a third party should descend the Great Fish River. Lieut. Pim particularly desired the use of small steamers, supplied with dogs for travelling purposes. Who could doubt that, had Sir John Franklin had the command of 20 men only, instead of 138, but he would have escaped from his icy prison as easily as Sir John Ross had done? The smaller number would enjoy abundance, while the larger number were perishing with hunger. The superiority of dogs over men for sledging purposes had, in Lieutenant Pim's opinion, been abundantly proved—frost being the most dreaded enemy of the men, whilst dogs are exposed to the severest inclemency of the weather with impunity. The most interesting locality for the search, was undoubtedly, King William Land; which, situated at the mouth of the Great Fish River, was, on account of its proximity to the magnetic pole, and the number of Esquimaux inhabiting its vicinity, who beyond a doubt were the depositaries of the Franklin secret, of the greatest importance. Having pointed out the field of search, Lieutenant Pim described the eastern road to it, or that by Lancaster Sound, as comparatively uncertain; while the western, or that through Behring Strait, he believed could be coasted by ships sooner or later in each year, along the northern shores of the American Continent. Captain Collinson had engaged to take a ship to Simpson Bay in ten months, and, indeed, had given it as his opinion to him, that he could take through the 'Marlborough,' the largest ship in the British navy.*

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* Lieut. Pim exhibited the fac-simile of a Chart drawn by an Esquimaux, on board the 'Enterprise,' pointing out the locality of two ships; but which Capt. Collinson, at the time, supposed to refer to the 'Victory,' abandoned by Sir John Ross in 1831.—Ed.

Sir Roderick Murchison, F.R.G.S., was sure the members would return their thanks to Lieutenant Pim for his communication, inasmuch as they would recollect the efforts made by that officer in the search after our missing navigators. No one could forget the bold enterprise which Lieutenant Pim formerly projected, the vigorous manner in which he set about it, with the full determination to reach, by a land journey over the wilds of Siberia, those distant regions in which Franklin and his associates were supposed to be fast bound in ice. Lieutenant Pim's antecedents were indeed an earnest that what he now proposed was worthy of the serious consideration of the Society. He, the Chairman, had been alluded to as having been one of the individuals, who had zealously advocated a final search for the relics of the 'Erebus' and 'Terror.' He, certainly, did take a very deep interest in the memorial which he himself presented to the First Minister of the Crown upon this subject; and he must say, that this document, signed as it was by many men eminent in science, as well as by experienced Arctic explorers, met with the full and entire favour of Lord Palmerston, who paid a very marked attention to it. Though he, Sir Roderick, had no right to hold out any prospect upon authority, it might still be hoped that Her Majesty's Government would think it due to the honour of a great country like Britain, which had spent so many thousands of pounds in the search after Franklin, not to abandon a last effort to detect the relics of the ships, and probably to find the log-books, and such records of those six years' wanderings in the far-off Arctic regions, as might well be preserved in the ice, and might be found by a survey in a circumscribed area. The Society would recollect, that this proposed expedition differed entirely from all former efforts to discover the direction even, in which the bold and gallant Franklin had sailed. Through the discoveries of Dr. Rae, we now know that within a very limited space indeed, the ships and their relics must lie. Again, that the spot could be easily reached, had been set at rest by Captain Collinson, who in a sailing ship passed to within one hundred and fifty miles of the area to which he adverted, along the north coast of America, and returned unscathed and without the loss of a man. If a screw vessel were propelled in that same course, there could not be the remotest doubt that one portion of the proposed scheme might be accomplished. Not being a naval man himself, he did not pretend to enter into the relative merits of an expedition by the east or the west. These were points which might be considered hereafter; but he did sincerely hope that a last effort might be made for the honour of our country. Our neighbours, the French, as stated in the memorial alluded to, in the case of the unfortunate catastrophe that befell La Perouse, had set an example, which, for the credit of our country, we ought to imitate. The moment our allies procured the first information respecting that ill-starred expedition, they sent out a considerable force to collect every remnant and record connected with it. These they had justly hung up as trophies in Paris, and such conduct was well worthy of imitation by other nations. In the event of the Government declining to send out an expedition, he was authorized to state that Lady Franklin, who had already expended so much in fitting out expeditions in the search after the missing navigators, would, though there might now be no chance of finding a living man of the party, spend her last farthing in making this effort. He still hoped that the Government would give to that noble-minded woman every possible support, and furnish the expedition with provisions and instruments, and with a well-found vessel.

Dr. Rae, F.R.G.S., said he had done, as no doubt others had when employed for the purpose, all he could to find traces of the missing expedition; but Lieut. Pim was perfectly right in saying that his discovery of relics in the region named was *unexpected*. He thought Sir John Franklin had gone in another direction; because on a former expedition Sir John had lost half his party in travelling over a short extent of the American continent. He concluded that Sir John Franklin would have followed the route taken by Sir John Ross in escaping from Regent Inlet; and this opinion induced him to think that he was not to be found in the neighbourhood where relics had been met with. He did not think, with many other authorities, that documents were to be found. The documents, whatever they were, would have been carried to the point where the last survivors rested. That was his opinion. The Esquimaux told him that they had found eight or ten books where the dead bodies were; that those books had "markings" upon them, but they could not tell whether they were in print or manuscript. On being asked what they had done with them, they said they had given them to their children, who had torn them up as playthings. This was such an answer as the Esquimaux would scarcely have formed from mere invention; it was just what children would do in this country or anywhere else. But wherever the vessels were left, there it was barely possible that remnants of books might be found; still it was clear that those books could give no account of the fate of the party seen near the Fish River. There was only one point connected with the discoveries made by Mr. Anderson, which at first appeared to him inconclusive, and that was the not finding traces of bodies. Upon considering the subject, and consulting Sir George Back's book, he came to the conclusion that they had been washed away or covered up with mud. On the low ground where the party encamped, the tide flowed nearly over the whole of it, in gales of wind from certain directions. There was a large river flowing down, and all who have lived in the northern parts of America, know the effect of such a river filled with ice flowing over a flat tract of country; that it carried away remains of much greater resistance than any that mere bodies could offer. He might also refer to Captain Penny in confirmation of this view of the case. When Captain Penny wintered up Northumberland Inlet, he found that whales' carcases and bones, which he had left nearly high and dry the previous season, had been removed by a process he could not account for; there was not a bone to be seen. With respect to the expedition proposed by Lieutenant Pim, he wished it might be carried out, because he thought that the information obtained, *if any*, would confirm the statements he had himself brought home. He would not at present say exactly what his plans were, but he wished to complete the survey of the north coast of America, which he had twice endeavoured to accomplish. It was said that the third time was lucky, and he should probably try the third time.

Mr. John Brown, F.R.G.S., wished to make an observation with reference to Peel Sound. He would caution geographers against the adoption of it as a Strait. It was not known to be a Strait. If they referred to the Blue Books they would find that Lieut. Browne, of Austin and Ommaney's expedition, went some distance down that Sound, and in his report pronounced it to all appearance "rarely if ever open for navigation;" in fact, he said, in parts it was frozen to the bottom. A little farther south, at Creswell Bay, by reference to Sir John Ross's trip down Prince Regent Inlet, they would find, looking west, a range of mountains—the Union Mountains—these must be some distance to the westward; they were very high; this again offered an obstacle to the supposition that Peel Sound was a strait. Again, farther south, at the western entrance of Bellot Strait, Capt. Kennedy and Bellot describe a "continuous barrier of land" from Cape Bird round to the north and west, forming a deep bay; this would shut out all idea then of Peel Sound being a strait. He would be sorry to see another failure by a search in that direction, after the many they had had. Probably the best place to put the ships would be down Prince Regent Inlet, but not so far south as to be locked up as Ross was,—say about Creswell Bay. But, after all, where, he would ask, did the party said to have perished at Montreal Island come from? He did not think they came down Peel Sound at all; had they done so, we should have expected to have found traces of them from its vicinity to Fury Beach. He thought Franklin, in his endeavours to carry out his instructions, had attained large westing from Cape Walker, as far west as 105° or 110°, and had got entangled by the heavy ice in the deep bay of Melville Sound, and that he endeavoured to escape south by a strait which he (Mr. Brown) thought existed at the bottom of Melville Sound, between it and Gateshead Island, in King William Land. In 1854, he expressed to Captain Collinson, just then arrived, his opinion as regarded that particular part being a Strait. The heavy fixed ice on the eastern side of Melville Sound, found by Captain Ommaney and Captain Osborn, the currents and other reasons, too long to be entered upon then, had led him to that conclusion. Captain Collinson said, he "thought it probable, and yet the thought never occurred to him when he was on the spot." He mentioned this to prevent future failure. At any rate the fate of Franklin and his followers could not rest where it was, and he thought if they went down Prince Regent Inlet, and then crossed over as Kennedy and Bellot did, and in the direction he (Mr. Brown) had indicated, that they might obtain traces of the relics at least, of the long absent expedition. The way by Behring Strait was an excellent one, but he feared it took too long a time from England.

Captain Maguire, R.N., said, he had been to Behring Strait four times, and as to the possibility of communicating with the mouth of Back River by the western route, he might state that he had been round Point Barrow three times, and he thought it was a navigation which might be undertaken without the slightest danger. Captain Collinson was of the same opinion. The advantages of the western route were threefold: 1st, the certainty of the ships arriving at the spot where the search has to be made; 2nd, in the event of any accident occurring to the vessel, the crew will be sure to reach the Hudson Bay settlements; 3rdly, that a travelling party (coming from the east) could not remain sufficiently long upon the spot so as to render the search complete and final. By this route, notice of the ship's progress can be conveyed by the Rat Indians from the Colville, and from Barter Island to Fort Youcon, and her safe arrival at her destination can be made known in England by the January following. Thus there would be no anxiety with regard to her safety. A vessel could get round by September; but by the eastern route it would be the spring following, before parties could reach there by travelling. This was a point of some importance, because information could not be got from the Esquimaux in a day or two. It took weeks, and it was very difficult to get correct information from them. By the western route, the passage from England to the mouth of Back River, could be undertaken with very little chance of stoppage. Captain Collinson had made the passage in one year, and Captain M'Clure in another, and they each could have got there by the month of September. A ship having arrived there, it would be very easy in the following spring, when the crews would not be employed about anything else, to try and find a way out by the eastward instead of returning as they went. But ships going in by the east, did not know how far they could get, and it was well known that Arctic travelling was a very laborious thing. People arriving at a place after a long journey, were not in a state to make a search with the same vigour they would exert if they were quite fresh.

Sir Roderick Murchison said, it was interesting to find that the remarks made by Lieut. Pim had been confirmed by so experienced an Arctic navigator as Captain Maguire, whose observations were quite in unison with those of Captain Collinson—both of these officers who had "gone and done the thing." The public must therefore not imagine that the search that the memorialists and Lieut. Pim advocated, was attended by those dangers which were connected with former indefinite searches. With reference to the character of the Esquimaux, among whom some of our people might have lost their lives, and some of our young men might be living, which was the opinion of Dr. Kane, he, Sir Roderick, hoped that the Bishop of Rupert Land, who was present, might afford them some information.

The Bishop of Rupert Land said his knowledge of the Esquimaux was very small. He had encountered them in two directions in his own territory; at one extremity near James' Bay, and at the other above York Fort. He had seen and conversed with them from both these quarters, and he thought if the Government should sanction an expedition such as Lieut. Pim proposed, some endeavour might be made at the same time to form the nucleus of a settlement among them. That excellent body, the Moravians, would be inclined to do anything in their power, in affording interpreters or anything necessary, in order to secure intercourse with the Esquimaux. He was also most anxious to do all that might be necessary with a view to planting a missionary clergyman permanently amongst them. In intellectual power he did not think they came up to the Indians, but they were superior, he thought, in moral qualities. He was sorry he could not give more information respecting these interesting people: all that he knew of them was favourable as regarded their dispositions. He hoped something would be done for them, in a religious point of view, so that the present opportunity might not be lost. Should such be the result of an expedition sent out by Government, he for one would hail it, as conferring a lasting benefit on that neglected and interesting people.

Lieut. Pim would like to impress upon the Society, especially, the necessity for having a ship *at* King William Land, because it would be most advantageous to winter close to the Esquimaux, so as to obtain a moral influence over them, and learn from them the precise whereabout of our countrymen. If, for instance, a travelling party left a ship wintering at Batty Bay, where the 'Prince Albert' wintered, and travelled all the way down, by the time they arrived at King William Land they would be exhausted, and the Esquimaux could easily overpower them if they felt so inclined. At all events, as Captain Maguire said, time was essential to make the Esquimaux divulge all they knew. Sir Edward Parry was a whole winter in the ice (1820), before he obtained any geographical information from the tribes in his vicinity. Therefore he (Lieut. Pim) was anxious that a ship should actually winter *at* King William Land. Mr. Brown had said it was a very long way round by Behring Strait. All he (Lieut. Pim) could say in reply was, that the longest way round was often the shortest way there. After the vessel arrived at King William Land, by way of Behring Strait, there would still be four weeks' summer before them, to devote to securing the safety of the ship, and explorations in boats; whereas, by the eastern route, there would be only just time to prepare for winter. Captain Collinson in his letter asserted that a ship could go from England to Simpson Strait by the westerly route in ten months. The passage was performed by the 'Investigator' in 1850; and by the 'Enterprise' in 1851, 52, 53, 54. They might therefore take it for granted that the channel was open all the season, and Captain Collinson even went so far as to assert that if Government ordered him, he would take the 'Marlborough,' the largest ship in the service, safely up to Simpson Strait; therefore the Society need not feel any anxiety about the risk the explorers would have to go through. The greatest risk would be with the Esquimaux, and he thought they would be obliged to go among them with caution in endeavouring to ascertain from them all that they knew about Franklin. As regarded the bodies having been washed off a low spit of land, he certainly did not agree with Dr. Rae on that point, because the very liability of the ground to be washed by the rising of the river, must have been observed by Franklin's people, and would have prevented them encamping there, and compelled them to take higher ground. He did not think they could attribute the fact of no vestiges being found to the nature of the ground. He (Lieut. Pim) stated this on his own experience, for having travelled after Dr. Rae's simple and excellent manner, without tents or superfluities of any sort, also after the tentative manner of a Government expedition, as well as making overland journeys, he might be considered a competent judge of causes and effects in the Arctic Regions.

Dr. Rae observed that the Esquimaux travelled in sledges and encamped on low ground. He also always pitched on low ground, because the snow was best there for building. The Esquimaux did the same. He had been accustomed to the Esquimaux from Mackenzie River round to York Fort, a small space excepted, and had lived among them with perfect safety. He had left three of his people at Repulse Bay, and on his return he found twelve native families living with them. Some of these were relatives or acquaintances of the men who were supposed to have murdered Franklin's party. They were a gossiping people, not a quiet people like the Indian, and they would have told him at once if any of the party had been alive. If the party had got up the Back River, they would have been perfectly safe, because the native Indians would have fed them and brought them to the Hudson Bay posts. Lieut. Pim said he had travelled in the west, but travelling in the west could give no idea of travelling in the east. He (Dr. Rae) travelled there as the Esquimaux did, and encamped as they generally did in the low flat country. Every one agreed that they would rather encamp on low ground than haul their sledges through the snow to higher ground above the water-line. The party of whites, who starved near the Fish River, had travelled thither on the ice, not by water, because the natives followed the sledge marks on the ice, and the bodies were found before the ice broke up. He had gone over a considerable extent of coast, about 2000 miles, and consequently could speak from his own experience; but he would not venture to express any opinion of what Dr. Kane or Lieut. Pim had experienced 1000 miles or so to the north and west.

Sir Roderick Murchison had no doubt every member of the Geographical Society was aware of the great merits of Dr. Rae's researches; and he was happy to have elicited from the Meeting a very general participation in the views of the gentlemen who signed the requisition to the Government, urging that another search, worthy of the country, ought to be made to discover the remnants of the Franklin expedition. He was also happy to hear that Dr. Rae himself intended to come forward, and he was not surprised at such an offer from so gallant and successful an Arctic traveller.

2. Dr. Vogel *on the Ivory-trade of Central Africa.*

Communicated by the Earl of Clarendon.

The African ivory which reaches the Mediterranean ports comes chiefly from Adamawa and Alimshé, south of the river Chadda. From Bu-Mauda and Shubbún on the Chadda it passes northward through Jacoba to Kano, whence it is transmitted across the desert by Ghadamsi merchants. The quantity thus obtained is said to be 50 tons annually. Bornu and Wadai also contribute a small supply. Dr. Vogel found the people on the Chadda refusing to supply the usual buyers from the north, as Dr. Baikie's expedition up the Chadda had led them to hope for the arrival of English ships. Dr.

Vogel recommends small trading establishments to be formed at Bu-Mauda and Shubbún. Those markets are in healthy situations, well supplied with all kinds of food, and intercept the trade to the north. Regular periodical communication is essential, as the unexpected arrival of vessels might find the people unprepared to trade, and cause disappointment. A legitimate and active trade would soon spring up in those parts, and be preferred by the natives to dealing in slaves, a traffic which would then be abandoned.*

Sir Roderick Murchison observed that in the early part of the evening allusion was made to the thanks of the Society to Dr. Kane for his expedition—an expedition which was more remarkable than any ever undertaken, inasmuch as it was done at the expense of two individuals of a kindred nation, or, as he might call them, our American brethren. That expedition having terminated, they had expressed their grateful thanks to those excellent Americans, who, in the search for Franklin, had distinguished themselves above all individual Englishmen. No one had acted the part of such pure philanthropists as Messrs. Grinnell and Peabody, both of whom, he was glad to say, were associated on the lists of the Royal Geographical Society.

He was happy to observe present, a gentleman who had taken part in the great survey across the Atlantic, for measuring the depths, and ascertaining the nature of the bottom of the sea, by which that gigantic scheme had been devised, which would unite the two nations in bonds, which he hoped never would be severed. Mr. Cyrus W. Field, the expositor, and in fact the promoter, of this great affair, was in the room, with some of the very materials with which the great connection was to be made. He thought he might call upon Mr. Cyrus Field to give a brief account of the remarkable manner in which the completion of the Atlantic telegraph was to be carried out.

3. *The Atlantic Telegraph.* By Cyrus W. Field, Esq., of the United States.

Mr. Cyrus W. Field said, that the remarks which the Chairman had just made (alluding to some distinguished Americans) to men whom he was proud to call his friends, had struck a chord in his heart. The Americans, their brethren on the other side of the Atlantic, wished to get nearer to their fatherland. They were jealous of the earlier acquired knowledge of the English, and were determined to obtain it. When the Atlantic cable is laid, they will know in New York what is to be done in London, before it is even done there, the difference in time being five hours.

Mr. Field then said, if they would allow him, he would present a profile of the Atlantic Ocean between Newfoundland and Ireland, which was made by order of the United States Government, under the direction of that distinguished man, Lieutenant Maury, of the navy of the United States. The commander of the expedition was Captain Berryman, of the United States steamer 'Arctic.'

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* According to the last accounts received by the Society from Dr. Vogel, dated Kuka, December 4, 1855, he intended then to visit Wadai, and afterwards to return to England early in 1857, by way of Adamawa, the Niger, and Fernando Po. Through H. M. Consul at Tripoli full supplies, both of money and articles of merchandise, had been sent to him.

The continuation of Dr. Vogel's important astronomical observations—the first portion of which were published in the 25th Journal of the Society—have not yet arrived.—Ed.

Mr. Field here exhibited the profile of the Atlantic; and the bed of the ocean was so level throughout the whole course, that, in making the Map, they had to exaggerate the vertical scale so that the depth appeared ten times greater than it actually was in proportion to the distances. The soundings were made according to the weather, not actually at so many miles apart, but as near as they could be made at stated distances. The deepest part was 2⅓ miles, or 2070 fathoms. This is nearly in the centre. When the plateau was discovered by Lieutenant Maury, he denominated it the "telegraphic plateau." Mr. Field here exhibited a portion of the cable. It was estimated that communications could be transmitted through this cable, with the improved code, at the rate of 30,000 words in 24 hours. The line was completed from New York to St. John's, Newfoundland, a distance of 1710 miles as the line was laid; and the president of that company had written to say that he had sent a message through it, and had received a reply within 15 minutes.

Mr. Field also exhibited specimens of the bottom of the Atlantic, brought up from over two miles in depth. There were no rocks to injure the cable, for the bottom of the ocean, throughout the whole distance, was composed of minute shells, so small that to the naked eye they appeared like sand, but when examined with a powerful microscope, they were seen to be most perfect in their formation., This plateau was evidently formed by the great Gulf-stream, which swept the Atlantic coast of the United States, and this being met by the cold currents from the north, the minute marine animals of tropical origin were probably killed, and their shells sunk to the bottom.

In conclusion, Mr. Field said he would only repeat an observation which he had made to a friend, that as on July 4th, 1776, the Americans had declared their independence of Great Britain, before July 4th, 1857, he hoped that they would again be annexed.

Third Meeting, Dec. 8, *Session* 1856–57.

Sir RODERICK I. MURCHISON, Vice-President, in the Chair.

Elections.—*The Hon. W. F. Campbell; Rear-Admiral the Hon. J. Gordon; Colonel Luke S. O'Connor; Lord Oranmore; Sir William Stuart, Bart.; and Robert Benson, William Benson, Walter Bryant, J. George Cooke, and John Costerton, Esqrs. were elected Fellows.*

The Chairman read the following letter, addressed to the Secretary, from the brother of their late President, Rear-Admiral F. W. Beechey:—

8, Westbourne Crescent, Dec. 2, 1856.

Sir,—It is my painful duty to record the death of your President, my brother, Rear-Admiral Frederick William Beechey, on the 29th ultimo.

I remain, Sir,
Your obedient servant,
S. Vincent Beechey, M.A.

The Secretary, Geographical Society.

Sir R. Murchison next read the following notice on the subject of Admiral Beechey's death:—

GENTLEMEN,—Before we proceed to transact the business of this evening's meeting, it is my painful duty to advert to the great loss we have sustained since we last assembled, by the demise of our excellent and distinguished President.

On the last day of meeting, Admiral Beechey attended in the morning at these apartments, and, feeling himself indisposed, requested me to act for him. On the Saturday afternoon following, alas! he was no more!

It is not in my power to record at this moment (nor is this the fitting occasion) all the deeds and merits of that gallant, good, and eminent man. His conduct throughout a well spent life, will doubtless be done justice to at our next Anniversary, by whomever may then occupy this chair.

Let me however say, in deploring his loss, that, associated as I have been with the Royal Geographical Society since its foundation, it has never fallen to my lot to see it presided over by one who more honestly, efficiently, and successfully devoted himself to the promotion of its interests, than Admiral Beechey.

So strong was the habit implanted in him, of leaving no business unfinished with which he was concerned, that his very last official act within these walls, and when evidently struggling under the disease which carried him off, was to hand over to me his written suggestions respecting the proceedings of the Council and the evening meeting; requesting me at the same time to dwell specially, in any observations from the Chair, on the support which the Society was receiving from Her Majesty's Government, and particularly from the Admiralty.

In truth, I feel convinced that our lamented President accelerated his demise by the indefatigable performance of his public duties, at a time when a fatal disease was overpowering him. Since the sad event, I have heard it indeed from the lips of the Minister of the Crown, under whom he officiated at the Board of Trade, that his conduct in that department was, in all respects, so commendable, that it would be a task of extraordinary difficulty to replace so valuable a public servant.

We here have also tested his value, for we have seen with what good sense, and kind and courteous manners, our late President has kept us united in friendly bonds, and how, under his guidance, the Society has risen to a pitch of prosperity unexampled in its annals.

The following resolution was next proposed by Mr. W. J. Hamilton, seconded by Colonel W. H. Sykes, and unanimously carried:—

"That the Chairman be requested to express the deep sorrow of the Fellows of the Royal Geographical Society on the demise of their distinguished President, Rear-Admiral F. W. Beechey, and to communicate their sincere condolences to his widow and family."

SIR RODERICK MURCHISON had now to announce from the Chair that it had pleased the Council, seeing the abeyance in which the office of President had fallen, for the first time since the Geographical Society had existed, to ask him to occupy the post. As that motion was passed unanimously, he would not shrink from his duty, provided the proposition met with the concurrence of the Society. But he must remind them that he was no longer what he had been. He was older than his departed friend, and it was not in the nature of things that he should carry out as vigorously and efficiently, as he did formerly, the duties thus imposed upon him. But, such as his powers might be, he could assure them that they would be devoted honestly, and, as far as practicable, exclusively to the interests of the Royal Geographical Society. He must at the same time say that it would be quite impossible for him to continue these duties beyond the ensuing Anniversary; and if it were the pleasure of the Society that he should occupy the office till that time, he would endeavour to support their interests now, as he had done formerly.

Mr. W. J. Hamilton, F.R.G.S., said, as a member of the Council, having been present when this subject, which was necessarily brought under their consideration, was discussed, he had great pleasure in rising to state that it was the unanimous wish of the Council of the Royal Geographical Society that Sir Roderick Murchison should undertake for the period he had mentioned, the duties which had hitherto been performed by their late lamented President. He begged leave, therefore, to propose that Sir Roderick Murchison do occupy the Chair of the Society until the ensuing Anniversary.

Colonel Sykes, F.R.G.S., said that, if he had been present at the Meeting of the Council, he should have joined most readily in the proposition now submitted. The Society was under a great obligation to Sir Roderick Murchison for consenting to undertake the office, which was no sinecure, requiring, as it did, no ordinary ability, zeal, or leisure, to be carried out efficiently. He most heartily seconded the proposition.

Sir Walter C. Trevelyan, F.R.G.S., observed that, as the worthy Chairman could not put the resolution himself, he begged to do so, and hoped it would be unanimously adopted, "that Sir Roderick Murchison do occupy the office of President until the next Anniversary." The resolution was carried unanimously.

Dr. Livingston.—The Chairman then announced his regret at the non-arrival of their expected guest, the celebrated explorer of Africa, Dr. Livingston, owing to the breaking down of the Peninsular and Oriental steamer, 'Candia,' after leaving Malta. He hoped, however, to have an opportunity very shortly of presenting him to the Society.

Arrival of the Resolute.—The expected arrival of the 'Resolute,' under the command of the American Arctic explorer, Captain Hartstene, as a present to her Majesty from the United States Government, was then announced from the Chair, as having been communicated that day by his Excellency the American Minister, Mr. Dallas.

The papers read were:—

1. *On the Determination of the River "Eulaeus" of the Greek Historians.*

By William Kennett Loftus, Esq.

Professor Long has remarked that the question as to the site of Susa is inseparable from that of its rivers. General Williams having made certain discoveries in the ruins of Shúsh, near Dizfúl, in Western Persia, in the following year the sum of 500*l.* was voted by Parliament, and, at the request of Colonel Rawlinson, Mr. Loftus undertook the excavations. The remains of two ancient palaces were uncovered. In the Journals of the Royal Geographical Society, the modern Kerkhah is correctly given as the Choaspes, the river of Diz as the Coprales, and the Kurán as the Pasitigris. Professor Long and Mr. Layard believe the Eulaeus to be the Shapúr, but Mr. Loftus considers that there was a bifurcation of the modern Kerkhah; one branch of which, passing on the east of Susa, eventually joined the Kurán below Bender-ghil. Thus the name Choaspes properly applied to the *western*, while that of Eulaeus referred to the *eastern* branch; and the name "Eulaeus" was also given to the united streams and the Pasitigris.

SIR R. MURCHISON remarked that the subject was not new to them—at least, the geographical portion of it—for the volumes of the Society contained references to this river, on the part of Col. Chesney, Lieut. Selby, and others. He—Sir Roderick—had no decided opinion to offer upon a subject which involved so much classical learning; but he would say that the paper—and this was the highest commendation he could give it—had met with the entire approbation of one of their most able comparative geographers, Col. Leake, and if he and Sir H. Rawlinson had been present, they would no doubt have spoken in the highest terms of its merits.

COL. SYKES, F.R.G.S., asked whether there was any appearance of such a physical alteration of the face of the country as might lead to the belief that the discrepancies, which existed between the present state of the country and the descriptions given of it by the Ancients, could be accounted for by any convulsions of nature, such, for instance, as earthquakes? In that view of the subject there seemed some value in the study of comparative geography; because, supposing these discrepancies to exist, we might infer that there must have been some great effort of nature to alter the courses of rivers and the forms of mountains. Thus there would appear to be a relation between comparative geography and geology.

MR. LOFTUS replied that there was no proof of any volcanic action ever having taken place in that region. He had been there four years, and never experienced any shock; but there had been a change in the course of these rivers. The Tigris and Euphrates had changed their courses continually; and it was the same with other rivers. The soil is alluvial, and as far up as Bussorah he found tertiary fossils—a species now existing in the Persian Gulf.

In answer to Colonel Sykes—

MR. LOFTUS said that Susa was 300 feet above the level of the sea, and that there are hills at the back; also that there is a great fall in the river, and that at the lower part it is called "Kurán." Mr. Loftus pointed to the copies of inscriptions from Susa and also to the plans of the palace upon the table.

GENERAL MONTEITH, F.R.G.S., said it was so many years since he made a survey of these rivers, that he must make an apology for offering any observations upon the subject under discussion. Had the Society then existed, a vast deal of information, which was now lost, would certainly have been preserved. He passed from Mohammerah to Ahwaz, and thence to Shuster, taking a survey of the river with the best means in his power, and he was not deficient in instruments. In the neighbourhood of Ahwaz there was a bund, which was drawn across the river, for the purposes of both navigation and irrigation. There was a bed of an apparently large river passing round Ahwaz, which he was informed was the Kurán, turned off in that direction artificially, to enable the natives to build the bund. There was a bridge over it. After the bund was established, the river was again turned into its old channel. This apparent bed of the river was about 100 or 150 yards in breadth, and he was led to suppose that it was the bed of another river. At Shuster there was another bund, which was perhaps the greatest work executed at the present time. He thought there was a mistake in the late survey where a canal had been given for the bed of the river. The canal was crossed by a bridge of thirty-two arches, and he was requested by the Persian authorities to offer any suggestion he could for the repair of this bund. He could only say that no engineer in Europe or elsewhere could have made a more beautiful work. The bunds were principally intended for irrigation. After leaving Shuster he proceeded to Ram-Hormuz, a distance of 90 miles, where there were signs of the bed of a river that came from the mountains which he crossed. On the other side of the mountains was an immense plain, extending, he might say, to Bagdad, which was crossed by two or three large rivers. But whether there had been any channels cut from these rivers he could not say. A river turned from its course for a short time would soon work for itself a new channel through the light soil of the country. Shuster never could have been a town of any importance; but the ruins of Susa, which he thought had been erroneously denied to be Susa, were 20 miles in circumference. It differed from every city that he had seen, by the streets being laid at perfectly right angles. There was one very large street, leading to the palace, which was an immense mound, little inferior to that of Babylon. In this was the reported tomb of Daniel. It was evidently an artificial mound, and well worthy of being opened; for greater discoveries might be met with in Susa, than in any other part of the world with which he was acquainted.

Colonel Sykes said that General Monteith had offered a solution of difficulties which had caused a vast deal of discussion. The rivers having been turned from their beds in the shifting soil described, it would be difficult to determine where they had run before.

General Monteith observed that it was 70 miles, by the shortest route, from the river to Ram-Hormuz, across a desert, and it was 90 miles from Susa.

Sir R. Murchison stated that, with reference to these Eastern countries, Humboldt had called attention to the changes which had taken place in large rivers within the historical era. The Oxus, the largest of all these rivers, manifestly flowed into the Caspian Sea in the time of Herodotus. There was no doubt that the course of that river had been changed; but he would not pretend to decide, after what had been stated, whether this had been produced by natural causes, as Colonel Sykes suggested, or by the erection of bunds, as General Monteith had remarked. There were gentlemen present who could tell them that large rivers had been changed by the works of the natives.

Colonel Sykes.—The Indus had apparently changed its course since the time of Alexander.

The President announced that the Secretary would read a short communication from Mr. Henry Poole, who was sent out by the Foreign Office to make a survey in the East for coal. He was not fortunate in finding coal of a good quality, and he was then directed to proceed to the Dead Sea in search of nitre. In searching the Dead Sea Mr. Poole fell in with some other phenomena, a short account of which would be given in the twenty-sixth volume of the Society's Journal:—

2. *Note on the Exploration of the Shores of the Dead Sea.* By Mr. Henry Poole.

Sir,—As my letter to the Earl of Clarendon, containing a report of my journey in Asia Minor and on the shores of the Dead Sea, has been forwarded by his Lordship to the Society, I take the liberty of expressing a hope that farther inquiries may be made on the shores of the Dead Sea, and I would beg to draw your attention to several points which I consider require verification, viz.:—

1. Can the lebias found at Em Barghek and Ain Terabeh live *in* the Dead Sea?

2. Are the minnows in the Jordan, mentioned by Lynch, not also lebias?

3. Are the waters of the Dead Sea of different densities, as well as temperatures, at different depths, as well as at different localities?

4. What is the mean dew-point, force of vapour, and relative humidity on the shores of the Dead Sea?

5. What is the mean temperature, as well as amount of radiation?

6. What is the mean height of barometer and boiling-point of water? Lynch gives the latter as 215°.

7. What do the wild-fowl feed upon which dive in the Dead Sea?

8. What causes the phosphorescence observed by Lynch in the Dead Sea?

9. What is the difference of sea-level at different seasons of the year, and will the evaporation compensate for the volume of water flowing into the Dead Sea?

10. I would also call your attention to the close approximation made with the Aneroid Métallique, when corrected by Delcros's formula for temperature and latitude, as shown in the accompanying table of heights of mountains in Westmoreland:—

Names of Mountains.	Heights per Aneroid in feet, by H. Poole.	Col. James, Ordnance Survey.	Difference.
Helvellyn	3056	3117	−61
Fairfield	2837	2861	−24
Highstreet	2693	2722	−29
Wansfell*	1649	1598	+51
Kirkstone Pass	1487	1466	+21
Ewe Crag, Loughrigg Fell	1123	1101	+22

It would thus appear that this very portable instrument may be advantageously employed for topographical surveying by using a proper formula for corrections.

If any further inquiries were made on the shores of the Dead Sea, it would be a good opportunity to carry a series of aneroid levellings through the valley of Acabá to the Red Sea; for in none of the above six heights is there near so much difference as is recorded between the barometrical altitudes of different places in Syria.

I found the temperature of the Dead Sea, in the month of October, about 82° Fahrenheit near the surface. The temperature of air during the day from 90° to 100°, and at night about 80°. By the imperfect mode of wetting the bulb of the thermometer, the dew-point was far below the extreme cases calculated in psychometrical tables. The evaporation was rapid, and the dryness very great, on the shores of the Dead Sea. My aneroid (I had no other barometer) showed a pressure of 31·50 inches and upwards, which is higher than the ordinary barometers are graduated to read.

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* I was not quite at the summit of Wansfell, which I assumed to be 30 feet above me, but it may not have been quite so much.

The small fish which I caught close to the shore of the Dead Sea, in a brine spring flowing into that sea near Usdum Mountain, at a temperature of 90°, and presented to the British Museum, have been named by Sir John Richardson, to whom they were submitted, as "Lebias," or Cyprinodon Hammonis of Cuvier, and which had been previously found in the Red Sea. He considers it would be of great interest to prove the fact if these fish live *in* the Dead Sea. At the time when I caught them, I believed them to be the young fry, and not full-grown fish, and therefore I kept all I caught, and never thought of putting any into the Dead Sea to see if they would swim in it. Similar, but larger, fish (about three inches long) were afterwards seen, but not caught, at Ain Terabeh, near the north end of the Dead Sea. The fish called minnows, caught by Lieut. Lynch in the Jordan, may also belong to the same class. If so, may not these fish have come down with the floods of spring, when the waters of the Sea would be less salt, and thus have been able to pass to the south end of the Sea, even supposing that they could not live in it at other periods of the year?

Lieut. Lynch states that the water is at an uniform temperature of 59° at a depth of 10 fathoms, while he found the surface temperature to average 76°. It would therefore be of great interest to obtain the specific gravities, as well as temperatures, of that Sea at different depths.

I observed three different kinds of wild-fowl swimming and diving in the Dead Sea, evidently feeding, and it would be of importance if some could be shot at such a time, so as to examine their crops and see the nature of their food. In theory, it would be as difficult for ducks to dive as fishes to swim in the Dead Sea, and therefore that objection must now fall to the ground.

Lieut. Lynch speaks of a phosphorescent appearance in the Sea, but I did not observe any: if water were obtained at such a time, it should contain animalcules.

The difference in the surface-level of the Dead Sea should also be noted at different seasons of the year.

As I have lately seen the report of some most interesting meteorological observations having been made at a considerable height at Teneriffe, I have thought if similar observations could be made on the shore of the Dead Sea (which is upwards of 1300 feet below the level of the Mediterranean), they would considerably enlarge the scale of observations; and data could be obtained to that depth for proving or correcting, in a descending scale, the formula respecting radiation, specific gravity, and other subjects of observation recorded by Professor Piazzi Smyth.

The President called attention to one or two points in the memoir, particularly to the one with respect to the species of fish mentioned—a remarkable little fish, which Mr. Poole had caught in a marshy spot on the shore of the Dead Sea. It had been submitted to Sir John Richardson, whom everybody knew was a high authority on ichthyology, and he had determined that it was a species which existed in the Red Sea, and also in all the fresh waters of Syria. The question of establishing a communication between the Mediterranean and the Red Sea was thus once more brought before them, and this little fish seemed to confirm the theory that there had formerly been a communication.

Sir John Richardson said the fish in question was described by Rüppell, and was known to Cuvier. It was a species of Cyprinodon, and was at one time confounded with the carps. He did not know how far the fish would go to prove the theory alluded to by the President. This species, now known as the *Cyprinodon Hammonis*, was first discovered in the oasis of Jupiter Ammon. It exists all over Syria in almost every pool, and Mr. Poole found it on the supposed site of Sodom, close to the Dead Sea, within a few feet of the shore, where the sea at certain times rose. Mr. Poole at first thought it came out of the Dead Sea; but it was found in a marsh fed by a salt spring. He had deposited specimens of the water of that salt spring, and also of the marsh in which he found the fish, in the Museum of Practical Geology; and if that office were to ascertain the specific gravity of these specimens, they might at once determine whether the water of the marsh approached to the Dead Sea in the quantity of salt it contained.* It was a fish which lived both in fresh and salt water, and it was abundantly found in the Red Sea. With respect to the ducks seen by Mr. Poole in the Dead Sea, it did not appear that he had shot any, or he would, probably, have found what they were feeding upon. It was an old notion that birds could not fly over the Dead Sea; but Mr. Poole had shown that they could not only fly over it, but live upon it.

In reply to Colonel Sykes, Sir John Richardson said that the specific gravity of the Dead Sea had been determined; it was about 1·227 to distilled water at 1·000.

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* Museum of Practical Geology, Jermyn-street.

Copy of a Note from Dr. Hofmann to Sir Roderick Murchison.

No. 1. Brine spring near Usdum with Fish. Temp. 90° Fahr., Spec. Grav. 1·035.

No. 2. North end of Dead Sea, near Jordan. Temp. 83° Fahr., Spec. Grav. 1·196. No. 3. Dead Sea, Usdum, South end. Temp. 83° Fahr., Spec. Grav. 1·204. No. 4. Peninsula, El Lisan, North end, Spec. Grav. 1·200.	Mean of Dead Sea at surface, Spec. Grav. 1·200.

According to Lynch—The specific gravity of the Dead Sea, at a temperature of 60° Fahr., and at a depth of 185 fathoms, is 1·2274, and that of the River Jordan is 1·00183.

The President stated that he had received a communication from Mr. Wilson, geologist of the North Australian expedition. A large portion of the letter related to details not absolutely connected with the Physical Geography of the region, but with the arrangements of the expedition. Mr. Wilson had, however, made an exploration of some importance in the neighbourhood, and had sent home a tracing of this part, which might be seen in the map-room. There were moreover some geological details in the communication, and those portions of the paper which related to the geography of the district would be printed in the "Proceedings" of the Society. Owing to the lateness of the hour, he would only direct the title of the paper to be read.

3. *Extracts from Notes on the North Australian Expedition.*[*] By Mr. J. S. Wilson.

Communicated by Sir Roderick I. Murchison.

Victoria River, July 11, 1856.

Dear Sir,—As I am to accompany the vessel to Timor, I shall take the opportunity to convey to you a concise account of the North Australian expedition since its arrival at Point Pearce. The horses were landed and encamped at a swamp by Mount Providence, and the sheep were put on board the schooner. Mr. Gregory arranged that himself and brother, accompanied by Dr. Müller, our botanist, and six men, should proceed with the horses round the head of the Fitzmaurice, across the Macadam and Sea Ranges, to Kangaroo Point on the Victoria River, while I was to take charge of the vessel, proceed up the river, and encamp where I should find it most suitable, at or above Kangaroo Point. I was accompanied by Mr. Elsey, surgeon and naturalist; Mr. Baines, artist and storekeeper; Mr. Flood, collector of natural history; and four men. We left Treachery Bay on the 25th of September, and got on well till we came to the shoals in front of the Musquito Flats; and here, through not knowing the passage sufficiently, the vessel grounded at high-water and high spring-tide, and could not be got off. The great danger at this place, in going up the river, results from the singular fact that the tide falls a foot to eighteen inches, while there is still a strong current running upward. This arises from the distance which the tide flows upward, as it does not reach the end of its course before the ebb has commenced at the mouth of the river. A vessel, therefore, going up the river, and grounding on one of these banks, cannot be got off until a higher tide carries her right over the bank. The spring-tides were declining at the time we thus got fixed, and we were within 12 miles of Kangaroo Point, but the river nearly all that distance is choked with sandbanks. There was only one cask of water on board for the sheep and people. I had already succeeded in finding a creek, with an abundance of water in pools; but we were then 3 miles past the place, and the nearest pool was half a mile from the river-side. I might have sent the sheep there, but my party was too weak to be divided between two camps and the vessel, the latter requiring all the assistance that could be afforded. The allowance of water to the sheep was stopped until more could be obtained, and we had but ten days to have a camp selected and ready to receive Mr. Gregory and party. To meet both these ends, I organized a party to proceed up the river to Steep Head, or such other place where we might find fresh water, and, at the same time, to look out the most convenient place for a camp. We had an India-rubber double boat, composed of four large air-tight bags; these we proposed to fill with fresh-water and tow them down the river. My party included Mr. Elsey, Mr. Baines, and two sailors. With the exception of a spring between Sandy Island and Steep Head, we found no fresh-water until we reached Palm Island, which we did with considerable difficulty, having to haul the boat over the stony shoals at Steep Head. On the evening of the sixth day, we got back to the vessel, and, on the following morning, the water was got on board, amounting to upwards of 500 gallons. On the morning of the 8th of October, I started, with Mr. Elsey and a sailor, in the small boat, to determine the place for our camp. I examined the slope of Sea Range for a distance of about 5 miles in a fruitless search for water, then returned to the boat and proceeded up the river after sundown, and reached a stony spit within a mile of Sandy Island, and stopped there the remainder of the night. In the morning we hurried up to where we had found the springs, dug two wells that promised an abundant supply, filled a small cask, and hurried to get back to the vessel. On our way back, we remembered indications of a large creek running eastward in front of Sea Range, and determined to look into it more particularly as we passed down. As we did so, we were astonished to find a river broad and deep enough to warrant our anticipating its having a long course. Being of a nature to turn Mr. Gregory out of the line he should follow, and delay him on his way to the camp, I ran the boat up its circuitous course till we were 6 miles in a straight line from the entrance; here we were stopped by a flat ledge of rock, over which the water was too shallow to pass with the boat except at high tide. Leaving the man in charge of the boat, we started on foot to trace the river up to a place where it might be supposed the horses would cross, and where they might find fresh water. We effected this at a distance of about 6 or 7 miles, where I marked some trees, and left a notice for Mr. Gregory, informing him where to find the camp. We then returned with all haste, and reached the schooner by noon on the next day. It was my intention to have sent a boat on the next day, with some of the sheep and a party to encamp at the springs, but the night-tide rose high and carried the vessel nearly over the bank, and there was a prospect of getting her off next tide, to effect which the help of all hands might be required. Having failed in this, I despatched a boat on the morning of the 14th, putting on board twenty sheep and some provisions, and appointing Mr. Elsey, with two men, to take charge of the camp, and Mr. Baines and Mr. Flood to return with the boat for another load. The boat returned on the 16th, and started again on the 17th with eighteen more sheep. Unfortunately they grounded on a bank near the Dome, and being delayed there nearly two days, some of the sheep died. They arrived at the camp, however, a few minutes after Mr. Gregory had been taken across the river to it in the dingy. Meanwhile, as I endeavoured to remove the sheep to the camp, the fate of the vessel became most critical. Being laid across the stream, the current washed away the sand from under both ends, leaving her supported only in the middle. The result was, the kelson, some of the floor-timbers, and two of the beams were broken, and there was every probability of her parting in two had she remained in that position much longer; but when the tide rose we succeeded in getting her shifted a little ahead into the hollow that had been washed out there. We soon after discovered that there were four feet depth of water in the hold, and it required the pumps to be kept at work all the time the tide was up to keep the water below that mark. During the time of low tide some of the principal leaks were found, and temporarily stopped. The spring-tides were increasing, with which we expected to get off. The boat sent to the camp being absent two days beyond the calculated time, much uneasiness was felt in consequence, and another boat was being prepared to send to the camp, when the former appeared with Mr. Gregory on board. Mr. Gregory informed us that his party had gone round by Steep Head to come to the camp. On the 24th of October the vessel was got off, but settled again on another bank near Alligator Point. I was next day sent ashore with the remaining sheep to be kept at water behind the Dome, which Mr. Gregory had found when passing there with the horses; Dr. Müller and two men were sent with me. The vessel was got off, and anchored opposite the camp on the 28th, and on the 30th two boats[*] arrived to take the sheep and party under my charge to the camp. On the day after my arrival at the camp, I was appointed to superintend the arrangement of the stores, and to inspect and cooper the damaged provisions.

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[*] *See* Proceedings R. G. S., No. I., pp. 5, 10: No. II., pp. 31, 32, 33, 49.—Ed.

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[*] Through the leakiness of one of these boats we lost 11 sheep.

After an unsuccessful endeavour to pursue the ascent of the river in boats, on the 24th of November, the Messrs. Gregory, Dr. Müller, and myself, with four riding horses and three with packs, left the camp on a preliminary journey, taking provisions for three weeks. We proceeded along the river to Timber Creek (so called from having found timber there to repair the schooner), and travelled along the creek upward, the course being generally south. The first 7 or 8 miles was through a beautiful valley, principally of a rich alluvial soil, covered with a dense growth of long grass and thinly timbered. The sandstone hills, rising abruptly on each side, were, in many places, picturesque. In the upper part of the valley cherty limestone rocks came to the surface in a broken state, which rendered travelling very difficult for the horses; 18 miles up this creek brought us to a dividing ridge 500 feet above the level of the sea. We were disappointed at not being able to see a range of hills southward. A range to the eastward rose high and distinctly, and seemed to strike toward the river. We travelled eastward, down a creek, until we found water, then struck off, in a N.E. course, along Beagle Valley and parallel with the range, which we supposed to be Fitzroy Range, until we came to the river at Emu Plains. There was abundance of grass, and the greater portion of the soil in the valley was excellent. From the last point we took an easterly course, leaving a range of hills between us and the river, which, however, we struck again after five hours' travelling. The river continued eastward for 7 miles more, and then turned to the S., all the way passing along a narrow valley, enclosed between walls of sandstone, but, after being followed 20 miles southward, it opened into a large plain. Being then on the W. side of the river, we were led off by a branch that came from the S.W. We followed it several miles, and then struck off to a range of hills from which apparently this river came. We ascended a hill at the eastern end of the range. After taking a hasty glance at the country beyond, I took advantage of the opportunity to examine the jasper rock forming the top of the hill. While thus employed, Mr. Gregory drew my attention to the ranges which struck off to the westward, and seemed to enclose the plains at a distance between 20 and 30 miles. I had maintained an opinion that the stream we had lately been tracing, was not the main body of the Victoria. Looking as he now desired me, I said the Victoria was certainly cut off in that direction; but, turning to the eastward, I said it would be found there yet. Mr. Gregory, however, was doubtful; he therefore left Jasper Range, with the intention of returning to the camp; but, as we descended to the lower side of the plains, he took the eastern side of Jasper Creek, and from the top of a little trap hill we could see a long belt of river-trees to the eastward stretching away S. Continuing our course, at little more than a mile from the place where we had left the main channel, we struck it again, broad, deep, and apparently undiminished. We halted there for the night, and on the next morning we followed up the river for nearly 30 miles, in a course a little E. of S., where it divided into two large branches. The rains had already commenced; there was an abundance of young grass springing up, and we returned to prepare for the journey to the interior. We traced our way back along the river, and arrived at the camp on the 13th of December, after an absence of twenty days.

Mr. Gregory calculating on being five months away, left the camp on the 3rd of January under my charge, taking with him Mr. H. Gregory, Dr. Müller, Mr. Baines, Mr. Flood, four stockmen, and all the horses, amounting to thirty-six.

During Mr. Gregory's absence I ran the boat up Saunders Creek for 6 miles, and went from thence on foot, accompanied by one man, to the east end of Sea Range, which I ascended for the purpose of getting a view of the valley beyond, from which the principal branch of the creek descends, and of the ranges on each side.

On the return of the expedition from the interior, as the preparations for the journey to the Gulf of Carpentaria were likely to occupy a month, I requested Mr. Gregory to permit me to occupy a portion of that time in obtaining a more extended knowledge of the geography and geology of the country east and west from the camp, as my duties in attending to the camp and the schooner had prevented my doing so to the extent I had intended. Accompanied by Messrs. Elsey and Müller, and with provisions for ten days, we took the gig, with two men, down the river to where the schooner lay. Putting some articles wanted at the camp on board the boat, I sent it back, and then, taking the dingy or jolly-boat, we proceeded up the western branch for 22 geographical miles, when further progress was interrupted by a rocky ledge. A sandstone range, exceeding 800 feet in height, ran parallel with the river on the north-west side. A detached hill, about 9 miles distant, being the farthest point of the range visible, I determined to go there and obtain a view of the country beyond. Accordingly, I left my two companions with the boat, and went alone to the hill, to which I gave the name of "Mount Victoria." From this hill I had a view of the river, 10 miles beyond, which enabled me to lay down its course for a distance of 40 miles, and its probable course full 20 miles farther in the same general direction. I could also see the Newcastle Range, extending unbroken until the view was cut off by a projection of the Murchison Range. I hurried back to my companions, and by walking at intervals during the night, though travelling was very difficult, I reached the boat after twenty hours' absence. We returned to the camp on the 28th of May, having been just ten days away.

The table-land over which Leichhardt passed at the heads of the Roper and South Alligator rivers, I feel satisfied is similar, in every respect, to the table-lands of the Victoria, and is, in fact, the eastern extremity of the same continuous and extensive sandstone formation. He gives an estimate of its elevation in his journal on the 17th of November, when he says, "We stood, with our whole train, on the brink of a deep precipice, of perhaps 1800 feet descent." This I suspect to be a typographical error; what he wrote may have been 800 to 1000 feet, which would correspond very well with the ranges of the Victoria. Capt. Stokes remarks (Vol. II. page 141), that he was forcibly struck with the resemblance between Moresby's Range on the west coast, 28° 50′ S., Sea Range at the Victoria, Cape Flattery on the north-east coast, 15° S.; and he adds Flinders' description of the coast-range at the head of the Australian bight. They exhibit great similarity in elevation, all being between 500 and 700 feet; and I may add my conviction that the table-land of the South Alligator is no more than 800 to 1000 feet, or corresponding to that of the Upper Victoria. Mr. Gregory found it as difficult to descend from Sea Range as Leichhardt did from the ranges of the South Alligator.

On the 21st of June, Mr. Gregory started on his journey to the Albert, taking with him, besides his brother, Dr. Müller, Mr. Elsey, and three stockmen. The schooner was ordered to be taken to Timor, to get a supply of fresh provisions for the ship's people, and, if possible, to leave the sick in hospital before sailing to the Gulf. Mr. Baines is in command of the expedition people on board, and takes with him Mr. Flood, myself, and seven men, with instructions to assist in taking the vessel there.

After Mr. Gregory and party left, ten days were necessary to take the camp-fittings, &c., down the river to the schooner. Finding myself unoccupied for that time, I determined to extend my investigations, and started next morning alone and on foot to go to Duke Mount. Two objects I had in view were, first to discover the source from whence a recent but extensive calcareous formation in the lower side of the plains was derived; and next, to obtain a more extended view of the plains westward, in both of which I was successful. In approaching Duke Mount, I saw a hill that projected farther into the plains a few miles distant. This hill I ascended, and was then enabled to see the extreme western end of Murchison Range, adding thereby 25 miles to my previous views on that side of the plains. I was also enabled to trace to a considerable extent a branch of the western river which Mr. Baines had seen, but did not follow; I have given the name of "Baines" to that branch, but the river itself I claim as my own discovery, and have named it.

The western end of the Murchison Range terminates in extensive plains. The most prominent hill in front of the range I have named "Mount Victoria;" it is not of itself worthy of such distinction, but the circumstance of my having ascended it on the anniversary of her Majesty's birthday, and obtained my most distant view of a western branch of the river that bears her Majesty's name, induced me so to name it. I enclose the leaf from my note-book on which I drew a sketch of the hill, when about one mile distant on the E. side. The Newcastle Range extends much farther than I have laid it down, and the Ellesmere Range I suppose to join the table-land to the eastward. The river Fitzmaurice most probably has its source in this range.

Arctic Squadron.—Captain Sherard Osborn next informed the Meeting that he had heard a few days since that Captain Penny, who wintered in Northumberland Sound last year, had received information which corroborated the intelligence brought home by Dr. Rae. Whalers generally kept dark the places they wintered in, as it was a question of money, but he knew pretty well where Captain Penny wintered, and he naturally inquired how, at that distance from where Dr. Rae obtained intelligence of the missing ships, he could have acquired his information. It puzzled him very much; the more so as Captain Penny spoke of the wreck of a ship. It struck him, however, that what Captain Penny had heard of, was the wreck of one of our deserted ships. He followed up the evidence as far as he could, and wrote to Captain Cator, R.N., who had commanded a vessel in an Arctic voyage, and who was now the conservator of the Humber at Hull, and consequently well acquainted with the captains of whaling vessels. He sent to him a series of questions, and asked him to procure answers. Through these inquiries he traced out what he believed was a fact—that two more of the abandoned ships had reached the shores of Davis Strait. Captain Penny observed that the Esquimaux had a great deal of ship-wood and treenails. After some trouble he found out that there were two ships near them, and that they were breaking them up and getting the wood out.

The Resolute.—The President next called attention to the fact that in a very short time they might expect the arrival in this country of their old ship the 'Resolute,' as purchased, fitted out, and sent home to us by the American Government. It was very desirable that all parties, who felt as lively an interest as he did in the subject, should testify their deep sense of this act of courtesy on the part of the American Government.

ERRATUM IN No. IV.

At page 97, insert, in the List of Memorialists, the name of *General Ed. Sabine,* which had been *accidentally* omitted.

ERRATUM IN No. V.

At page 173, last line but six, for "*visited,*" read "*named.*"

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1856–7.

Fourth Meeting (*Special*), *Dec.* 15, 1856.

The PRESIDENT, Sir RODERICK I. MURCHISON, in the Chair.

In opening the Meeting, the Chairman said,—

GENTLEMEN,—We are now specially assembled to welcome Dr Livingston, on returning from Southern Africa to his native country after an absence of sixteen years, during which, while endeavouring to spread the blessings of Christianity through lands never before trodden by the foot of a British subject, he has made discoveries of incalculable importance, which have justly won for him, our Victoria or Patron's Medal.

When that honour was conferred in May, 1855, for traversing South Africa from the Cape of Good Hope by Lake Ngami and Linyanti to Loanda on the west coast, the Earl of Ellesmere, then our President, spoke with eloquence of the "scientific precision, with which the unarmed and unassisted English Missionary had left his mark on so many important stations of regions, hitherto blank."

If for that wonderful journey, Dr. Livingston was justly recompensed with the highest distinction we could bestow, what must be our estimate of his prowess, now that he has re-traversed the vast regions, which he first opened out to our knowledge? Nay, more that, after reaching his old starting point at Linyanti in the interior, he has followed the Zambesi, or continuation of the Leambye river, to its mouths on the shores of the Indian Ocean, passing through the eastern Portuguese settlements to Quilimane,—thus completing the entire journey across South Africa. In short, it has been calculate that, putting together his various journeys, Dr. Livingston has not travelled over less than eleven thousand miles of African ground.

Then, how does he come back to us? Not merely like the far-roaming and enterprising French missionaries, Huc and Gabet, who though threading through China with marvellous skill, and contributing much to our knowledge of the habits of the people, have scarcely made any addition to the science of physical geography; but as the pioneer of sound knowledge, who, by astronomical observations, has determined the site of numerous places, hills, rivers, and lakes, nearly all hitherto unknown to us.

In obtaining these results, Dr. Livingston has farther seized upon every opportunity of describing to us the physical features, climatology, and geological structure of the countries he has explored, and has made known their natural productions, including vast breadths of sugar-cane and vine-producing lands. Pointing out many new sources of commerce, as yet unknown to the enterprise of the British merchant, he gives us a clear insight into the language, manners, and habits of numerous tribes, and explains to us the different diseases of the people, demonstrating how their maladies vary with different conditions of physical geography and atmospheric causes.

Let me also say that he has realised, by positive research, that which was necessarily a bare hypothesis, and has proved the interior of Southern Africa to be a plateau traversed by a network of lakes and rivers, the waters of which, deflected in various directions by slight elevations, escape to the eastern and western oceans, by passing through deep rents in the hilly, flanking tracts. He teaches us that these last high grounds, differing essentially from the elevated central region, as well as from the rich alluvial deltas of the coasts, are really salubrious, or, to use his own language, are perfect *sanatoria*.

I have thus alluded, in the briefest manner, to the leading additions to our knowledge, which have been brought before you by Dr. Livingston. The reading of the last letters, addressed to myself, was, by the direction of my lamented predecessor, Admiral Beechey, deferred until the arrival of the great traveller; in order that the just curiosity of my associates might be gratified by having it in their power to interrogate him upon subjects of such deep importance; and, above all, that we might commit no mistakes in hastily constructing maps from immature data; certain sketch maps having been sent to us, before it was possible to calculate his observations and reduce them to order.

Passing then from this meagre outline of the results to science, what must be our feelings as men, when we mark the fidelity with which Dr. Livingston kept his promise to the natives who, having accompanied him to St. Paul de Loando, were reconducted by him from that city to their homes? On this head my predecessors and myself have not failed, whenever an opportunity occurred, to testify our deep respect for such noble conduct. Rare fortitude and virtue must our Medallist have possessed, when—having struggled at the imminent risk of life through such obstacles, and escaping from the interior, he had been received with true kindness by our old allies the Portuguese at Angola—he nobly resolved to redeem his promise, and retrace his steps to the interior of the vast continent. How much, indeed, must the moral influence of the British name be enhanced throughout Africa, where it has been promulgated that our missionary has thus kept his plighted word to the poor natives who faithfully stood by him!

Turning to Dr. Livingston, the President then said—Dr. Livingston, it is now my pleasing duty to present to you this our Patron's or Victoria Medal, as a testimony of our highest esteem. I rejoice to see on this occasion, such a numerous assemblage of geographers and distinguished persons, and that our Meeting is attended by the Ministers of foreign nations.* Above all, I rejoice to welcome the Representative of that nation whose governors and subjects, in the distant regions of Africa, have treated you as a brother, and without whose aid many of your most important results could not have been achieved. Gladdened must be the hearts of all the geographers present, when they see you attended by men, who accompanied and aided you in your earliest labours. I allude particularly to our own Fellows, Colonel Steele, Mr. Cotton Oswell, and Captain Vardon, who are now with us. As these and other distinguished African travellers are in this room, and among them Dr. Barth, who alone of living men, has reached Timbuctu and returned, may not the Geographical Society be proud of such achievements? I therefore, heartily congratulate you, Sir, on being surrounded by men, who certainly are the best judges of your merits, and I present to you this Medal, as a testimony of the high admiration with which we all regard your great labours.

Dr. Livingston replied:—Sir, I have spoken so little in my own tongue for the last sixteen years, and so much in strange languages, that you must kindly bear with my imperfections in the way of speech-making. I beg to return my warmest thanks for the distinguished honour you have now conferred upon me, and also for the kind and encouraging expressions with which the gift of the Gold Medal has been accompanied. As a Christian missionary, I only did my duty, in attempting to open up part of southern inter-tropical Africa to the sympathy of Christendom; and I am very much gratified by finding in the interest, which you and many others express, a pledge that the true negro family, whose country I traversed, will yet become a part of the general community of nations. The English Government and the English people, have done more for Central Africa than any other, in the way of suppressing that traffic, which has proved a blight to both commerce and friendly intercourse. May I hope that the path which I have lately opened into the interior, will never be shut; and that in addition to the repression of the slave trade, there will be fresh efforts made for the development of the internal resources of the country? Success in this, and the spread of Christianity, alone will render the present success of our cruisers in repression, complete and permanent. I cannot pretend to a single note of triumph. A man may boast when he is pulling off his armour, but I am just putting mine on; and while feeling deeply grateful for the high opinion you have formed of me, I fear that you have rated me above my deserts, and that my future may not come up to the expectation of the present. Some of the Fellows of your Society—Colonel Steele, Captain Vardon, and Mr. Oswell, for instance—could, either of them, have effected all that I have done. You are thus not in want of capable agents. I am, nevertheless, too thankful now, that they have left it to me to do. I again thank you for the Medal, and hope it will go down in my family as an heirloom worth keeping.

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* The Ministers of Russia and Sardinia were also present.

The Right Hon. H. Labouchere, m.p., Her Majesty's Secretary of State for the Colonies, then said,—Sir Roderick Murchison, I thought it a great privilege to be allowed to attend to-night upon your invitation; and certainly with little expectation that I should be called upon to address you on this interesting occasion. I am happy to say, however, that the Resolution which has been put into my hands, and which I have been requested to propose to the Meeting, is one that I am sure will require no arguments of mine to recommend it to your very cordial adoption. You have heard from the President, how the distinguished traveller, who is here to-day to give an account of the achievements which he has performed on the field of Africa, you have heard, how cordially and usefully he was assisted by the Governors of the Portuguese Establishments on the coast of Africa. There is, perhaps, no nation which can boast more than Portugal, of having largely contributed to early geographical enterprise, to our better knowledge of the globe which we inhabit, and to the spread of commerce throughout the earth. I may also say that the mention of the name of Portugal is always agreeable to British ears, because there is no country with which we are united by an older, by a closer, and, I trust, by a more enduring connection. I think it is fortunate and gratifying to us, on the present occasion, that we have the advantage of having among us, the distinguished nobleman who represents Portugal in this country; therefore, we shall be able to convey to the Portuguese authorities, through him, the acknowledgment which, I am sure, we must be all anxious to make on the present occasion. I am too well aware of the value of your time, and of the superior claims that others have upon it, to be desirous of addressing you at any length. Of the importance of the discoveries made in Africa, I am sure we must all feel the strongest and deepest sense; it is, at all events, a matter of liberal curiosity to all men, to obtain a better knowledge of our earth. But there are interests very dear to the people of this country, which are closely connected with everything that relates to a better knowledge of Africa. There is none, I believe, which has taken a faster hold on the people of Britain than, not only to put a stop to the horrible traffic in slaves, which was once the disgrace of our land as much, if not more than of any other; but also, as far as possible, to repay to Africa the debt which we owe her, by promoting in every manner, with regard to her inhabitants, the interests of civilization and commerce. We must feel how important a better knowledge of the internal resources and of the condition of Africa must be, in all the efforts which Parliament or Statesmen can make in that direction. I will not trespass longer upon your time, but conclude by reading the Resolution which has been placed in my hands, and which is one that I am sure will meet from you, a very cordial reception :—

"That the grateful thanks of the Royal Geographical Society be conveyed, through his Excellency Count de Lavradio, the Minister of the King of Portugal, to His Majesty's Authorities in Africa, for the hospitality and friendly assistance they afforded to Dr. Livingston, in his unparalleled travels from St. Paul de Loanda to Tete and Quilimane, across that continent."

Sir Henry Rawlinson, F.R.G.S., then said—Sir, I could have wished that the task of seconding the Resolution had been confided to abler hands; but since the President has issued his orders—orders which are equivalent to the laws of the Medes and the Persians, with which I am tolerably well acquainted,—I am obliged humbly to bow to the task. After the eloquent description you have heard of the merits of the Portuguese nation, it would ill become me to intrude long upon your time; but I would wish to call your attention to the really great obligations which science is generally under to the Portuguese, especially with regard to the geography of Africa. We are too apt to forget the debt of gratitude which we owe to them for our knowledge of the interior of Africa, almost up to the present time, when Dr. Livingston has completed the chain of their discoveries. We must remember that it was Vasco de Gama, a Portuguese, in the first instance, who doubled the Cape of Good Hope. The Portuguese have established settlements throughout Southern Africa from the earliest times down to the present, and until Dr. Livingston has laid down all his discoveries upon the map, the old Portuguese maps of the interior of Africa, especially the southern portion, are the best available. It is singularly interesting and gratifying to find, that it should be to the Portuguese Governors, that we are indebted for the hospitable reception, which they gave to our distinguished traveller, Dr. Livingston, and which has enabled him to return home in safety, and acquaint us with the results of all his discoveries. As you are about to hear from Dr. Livingston some brief account of his travels, I will not longer trespass on your time, but merely second the Resolution which has been submitted to your notice.

The Resolution having been put from the Chair, was carried unanimously.

The Count de Lavradio then rose, and after a brief apology in English for his want of fluency in our language, thus spoke in French :—

M. le Président,—Je ne m'attendais pas à avoir l'honneur de parler devant vous; ce fût donc avec hésitation que je me suis levé, et c'est avec timidité que je vais avoir l'honneur de vous adresser quelques paroles, pour vous ex-

primer ma gratitude de la résolution que vous venez de prendre et de proclamer.

Mon premier devoir est d'adresser mes, aussi sincères que vifs, remercimens au nom du Souverain que j'ai l'honneur de représenter, et de la nation Portugaise à laquelle j'appartiens, au Right Hon. Mr. Labouchere, non seulement pour la résolution qu'il a proposé à la Société Royale de Géographie d'adopter, mais aussi pour les sentiments d'admiration et d'estime qu'il a si bien exprimé pour la mémoire des intrépides et savants navigateurs Portugais qui, en découvrant des mers et des terres jusqu'alors inconnues, portèrent partout les germes de la civilisation, et rendirent des très grands services aux sciences. A Sir H. Rawlinson, je prie aussi de vouloir bien recevoir mes remercimens, pour l'aimabilité avec laquelle il a appuyé la proposition de Mr. Labouchere, en rappelant au souvenir de la Société, les importantes découvertes faites par les Portugais ; à vous, M. le Président, pour la bienveillance avec laquelle vous avez soumis à l'approbation de la Société, la proposition de Mr. Labouchere ; et à vous, Messieurs les Membres de la Société Royale de Géographie, pour l'unanimité de votre approbation.

Je vous assure, que je m'empresserai d'avoir l'honneur de transmettre à mon gouvernement, la résolution qui vient d'être prise, et j'en suis sûr il en sera très flatté. Lorsque j'ai appris que le Dr. Livingston allait entreprendre de traverser l'Afrique Méridionale, en allant de la côte occidentale à l'orientale, j'ai écrit à mon gouvernement, en le priant d'expédier les ordres les plus positifs, pour que tous les colonies Portugaises s'en prêtent au Dr. Livingston, toute la protection dont il pourrait avoir besoin, pour poursuivre ses voyages d'une manière sûre et convenable. Je suis donc heureux d'apprendre que les ordres de mon gouvernement furent exécutés.

Maintenant, M. le Président et MM. les Membres de la Société Royale de Géographie, permettez-moi, que je vous remercie en mon propre nom, de l'honneur que vous avez bien voulu me faire en m'invitant à cette séance. En toute occasion, j'aurais été heureux et fort honoré de me trouver parmi l'élite des savans géographes et voyageurs Anglais ; mais aujourd'hui, mon bonheur est encore plus grand, puisque cette séance solennelle est particulièrement destiné à célébrer le retour en Europe du Dr. Livingston, de ce savant courageux, de cet ami de l'humanité, qui, bravant les plus grands dangers, s'exposant à toute sorte de privations, employa les plus belles années de sa vie, à parcourir l'Afrique Centrale dans les seuls buts d'enrichir les sciences, et de propager dans les régions lointaines, la morale évangélique, et avec elle les bienfaits de la véritable civilisation.

Des hommes, tels que le Dr. Livingston, sont, permettez-moi l'expression, des véritables Providences, que le Ciel, dans sa clémence, nous accorde pour nous consoler de tant d'individus inutiles ou méchants qui peuplent une partie de la terre.

Tout le monde sait qu'il y a à peu près quatre siècles et demie, que quelques navigateurs Portugais, aussi courageux qu'instruits, entreprirent et achevèrent des grandes découvertes. Les noms de Zamo, de Prestrillo, des Dias, du grand Vasco de Gama, et de tant d'autres, sont bien connus ; mais tout le monde ne sait pas que, en même temps que ces navigateurs parcouraient les mers, reconnaissaient les côtes, et tâchaient de faire le tour de l'Afrique, pour se rendre en Asie, d'autres tâchaient d'arriver au même but, en traversant l'intérieur de l'Afrique. Avant l'année 1450, par les ordres et avec les instructions du grand et immortel Infante Don Henri de Portugal, le prince le plus savant et le plus grand de son temps, Jean Fernandez pénétra dans l'intérieur de l'Afrique, où, peu de temps après, alla le rejoindre Anton Gonsalves.

Quelques années après, plusieurs autres Portugais pénétrèrent dans l'intérieur de l'Afrique ; quelques uns furent à la recherche de Timbuctu, et d'autres dans diverses autres directions. L'histoire nous a conservé les noms de plusieurs de ces voyageurs, et on peut dire que les Portugais n'ont jamais interrompu leurs tentatives de pénétrer dans l'intérieur de l'Afrique. Vers le fin du siècle dernier, le savant Dr. Lacerda, muni de bons instruments, se proposa de traverser l'Afrique Méridionale, allant de la côte orientale vers l'occidentale. Malheureusement, la mort l'a surpris au milieu de ses savants voyages, dans les états du Roi de Cazembe.

Plus tard d'autres voyageurs entreprirent de traverser l'Afrique, et de 1806 à 1811, Pedro Jean Baptista et Amaro José, avec les instructions du Colonel Francisco Honorato de Castro, allèrent de la côte occidentale à l'orientale, et revinrent à Loando par le même chemin, après une absence de plus de quatre ans. Le journal de leurs voyages a été imprimé. Malheureusement, ils n'étaient pas assez instruits, pour pouvoir déterminer astronomiquement la position des différents lieux, qu'ils ont parcouru.

Messieurs, je m'arrête, et si je cite ces faits et ces noms, ce n'est nullement pour diminuer la gloire qui appartient au Dr. Livingston; bien au contraire, c'est pour reconnaître qu'il a obtenu des résultats, plus complets que ceux qui le précédèrent. Le nom du Dr. Livingston est déjà inscrit dans l'histoire de la civilisation de l'Afrique Méridionale, et il y occupera toujours, une place très distinguée.

Honneur donc au savant Dr. Livingston!

M. le Président, et Messieurs, je vous demande pardon d'avoir si long-temps abusé de votre complaisance, et je vous remercie de la bienveillance avec laquelle vous avez daigné m'écouter; mais avant de m'asseoir, permettez encore que je vous prie d'agréer les vœux que je fais pour la prospérité de la Société Royale de Géographie, qui a rendu tant et de si grands services aux sciences, au commerce, et à la civilisation. Agréez aussi les vœux que je fais pour que l'empire Britannique, cette terre d'ordre et de liberté, ce pays où tous les malheurs trouvent un asile sûr et généreux, conserve pour toujours sa puissance. Je fais ces vœux, comme représentant du plus ancien, du plus constant, et du plus fidèle allié de l'Angleterre; je les fais aussi comme simple individu.

The Secretary then read extracts from the three last communications, addressed by Dr. Livingston from Africa to Sir Roderick Murchison, which had been reserved for that occasion. They were full of minute and graphic details relating to the regions explored by the traveller, and were listened to with the utmost interest. At their conclusion,

The President said: We return thanks to Dr. Livingston for having communicated these able documents to us, a very small portion of which has been read by Dr. Shaw. It is impossible, on an occasion like the present, fully to estimate the value of Dr. Livingston's communications; but there are so many subjects, some of them of deep interest to persons here assembled, and others of vast importance to the world at large, that I hope Dr. Livingston will explain to us, *vivâ voce*, some of those remarkable features in his travels, on which he would wish most to dwell. I particularly invite him to indicate to the Meeting, those portions of the country, the produce of which is likely to be rendered accessible to British commerce. I wish him to point out, on the diagram made for this occasion by Mr. Arrowsmith, the lines of those ridges which he describes as perfect *sanatoria* or healthy districts, distinguished from the great humid or marshy region in the interior, and as being equally distinguished from the deltas on the coast, in which the settlements of Europeans have hitherto been made. It is important to observe that large tracts of this country are occupied by *Coal-fields*, of which we have had the first knowledge

from our distinguished traveller. There are indications throughout the flanking ranges, of great disturbance of the strata, by the intrusion of igneous rocks which have very much metamorphosed them. The strata upon the two sides of Africa, dip inwards, and the great interior region thus forms an elevated plateau arranged in basin-shape. This vast basin is occupied by calcareous tufa, the organic remains in which seem to indicate that at a period not remote in the history of the globe, this great marshy region has been desiccated, leaving in these broad plateaus of calcareous tufa, the remains of lacustrine and land animals, which are still living in the country. I hold in my hand a geological map of the Cape territory as prepared by Mr. Bain, which, coupled with the discovery of Lake Ngami, led me to offer to you that speculation on the probable physical condition of the interior of Africa which the observations of Dr. Livingston have confirmed.*

Dr. Livingston then rose, and, pointing to the diagram of Africa, said: The country south of 20° is comparatively arid; there are few rivers in it, and what water the natives get, is chiefly from wells. But north of 20°, we find a totally different country, wonderfully well watered, and very unlike what people imagine Central Africa to be. It is covered by a network of waters, which are faintly put down in the map, and chiefly from native information. The reason why we have trusted to native information in this case, is this: when Mr. Oswell and I went up to the Chobé in 1851, we employed the natives to draw a part of the Zambesi in the centre of the country, which had hitherto been unknown to Europeans. They drew it so well, that although I have since sailed up and down the river several times, and have taken observations all along, I have very little to add to that native map. The natives show on their maps that you can go up one river and get into another. You can go up the Kama, for instance, and get into another, the river of the Banyenko. You can go up the Simãh and get into the Chobé, and can come down into the Zambesi, or Leambye. You can go up the river Teõge, and round again by the Tzõ to Lake Ngami. If you go up the Loi, you can get into the Kafue. And they declare that if you go up the Kafue in a canoe, you can get as far as the point where that river divides from the Loangua. All these rivers are deep and large, and never dry up as the South African rivers do. Some will say that the natives always tell you that one river comes out of another. Yes, if you do not understand the language you may say so. I remember when Colonel Steele and I were together, the natives pointed him out as still *wild*, and said I was *tame*, because I understood the language. Now, I suppose, when a geographer tells you that, when the natives say, "one river runs into or out of another," they don't mean what they say; but, in reality, the natives mean that the geographer is still *wild*, he is not *tame*, *i. e.* he does not know the language. I found the natives to be very intelligent; and, in this well watered part, to be of the true Negro family. They all had woolly hair, and a good deal of it, and they are darker than those who live to the south. The most remarkable point I noticed among them, was the high estimation in which they hold the women. Many of the women become chiefs. If you ask a man to do something for you, he will perhaps make some arrangement about payment; but before deciding to do it, he is sure to say, "Well, I will go home and ask my wife." If the wife agrees to it, he will do what you want; but if she says no, there is no possibility of getting him to move. The women sit in the public council, and have a voice in the deliberations. Among the Bechuanas the men swear by their fathers, but among the true negroes they swear by their *mothers*. Any exclamation they make is, "Oh, my mother!"—while among the Bechuanas and the Caffres they swear by their father. If a woman separate from her husband, the children all go with the mother—they all stick by the mother. If a young man falls in love with a young woman of another village, he must leave his own village and live with her; and he is obliged to keep his mother-in-law, in firewood. If he goes into her presence, he must go in a decent way, clapping his hands in a supplicatory manner; and if he sits, he must not put out his feet towards her—he must bend his knees back, and sit in a half-bent position. I was so astonished at this, that I could scarcely believe their own statements as to the high estimation in which they held the ladies, until I asked the Portuguese, if they understood the same, as I did. They said, exactly the same; they had been accustomed to the natives for many years, and they say that the women are really held in very great estimation. I believe they deserve it; for the whole way through the centre of the country, we were most kindly treated by them. When I went up the Zambesi, I proceeded as far as the 14th degree, and then returned to Linyanti. I found the country abounding in all the larger game. I know all the country through which Mr. Gordon Cumming and others have hunted, and I never saw anything before like the numbers of game that are to be found along the Zambesi. There are elephants all the way to Tete, in prodigious numbers, and all the other large game, buffaloes, zebras, giraffes, and a great variety of antelopes. There are three new species of antelope that have never been brought to Europe.

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* *See* President's Address, vol. xxii, p. cxxii, 1852.

Seeing the country was well supplied with game, I thought it was of little use burdening my men with other provisions; I thought I could easily supply our wants with the gun, and I did not wish to tire them and make them desire to return before we had accomplished our journey; so we went with scarcely anything. All the way up the river we had abundance of food, and any one who is anything of a shot, may go out and kill as much in two or three hours, as will serve for three or four days. The animals do not know the gun, and they stand still, at bowshot distance. We got on very well in this way, until we came to Shinté. There we found that the people, having guns, had destroyed all the game in the district, and that there was nothing left, but mice; you see the little boys and girls digging out the mice. I did not try to eat them, but we were there obliged to live entirely upon what the people gave us. We found the women remarkably kind to all of us; the same in going down the Zambesi. Whatever they gave, they always did it most gracefully, very often with an apology for its being so little. Then, when coming to the eastward, we found it just the same. They supplied us liberally with food wherever we went, all the way down, till we came near to the settlements of the Portuguese. In the centre of the country, we found the people generally remarkably civil and kind; but as we came near to the confines of civilization, then they did not improve. We had a good deal of difficulty with different tribes, as they tried to make us pay for leave to pass. It so happened that we had nothing to pay with. They wanted either an ox, a gun, or a man. I told them that my men had just as good a right to give me, as I had to give one of them, because we were in the same position—we were all *free men*. Then they wanted an ox, and we objected to it, saying, "These oxen are our legs, and we cannot travel without them; why should we pay for leave to tread upon the ground of God, our common Father?" They agreed it was not right to ask payment for that, but said it had always been the custom of the slave-traders, when they came in, to give a slave or an ox, and we ought to do the same. But I said, "We are not slave-dealers, we never buy nor sell slaves." "But you may as well give us an ox," they replied, "it will show your friendship; we will give you some of our food, if you give us some of yours." If we gave them an ox, they very often gave us back two or three pounds of our own food: this is the generous way they paid us back. But with the women we never found any difficulty

Let me mention the punishment which women inflict upon their husbands in some parts. It is the custom of the country for each woman to have her own garden and her own house. The husband has no garden and no house, and his wives feed him. I have heard a man say, "Why, they will not feed me; they will give me nothing at all." A man may have five wives, and sometimes the wives combine and make a strike against him. When he comes home he goes to Mrs. *One*. She says, "I have nothing for you; you must go to Mrs. *Two*." He then goes to Mrs. *Two*, and she says, "You can go to the one you love best;" and in this way the husband is sent from one to the other, until he gets quite enraged. In the evening I have seen the poor fellow get up in a tree, and in a voice loud enough to be heard by the whole village, cry out, "I thought I had married five wives, but I find I have married five witches; they will not let me have any food." The punishment a woman receives for striking her husband, I thought very odd, the first time I saw it in the town of Sechele. The chief's place is usually in the centre of the town. If a woman happens to forget herself so far as to give her husband a blow, she is brought into the centre of the town, and is obliged to take him on her back and carry him home, amid the jeering and laughter of the people, some of the women crying out, "Give it to him again." Slavery exists in the country, *i. e.* domestic slavery; but the exportation of slaves is effectually repressed. I found in Angola, that slaves could scarcely be sold at all. I saw boys of 14 years of age, sold for the low sum of 12*s*. If they could send these to Brazil, they would fetch a very much higher price, perhaps 60 dollars. In passing along, we went in company with some native Portuguese, who were going into the interior, and who had eight slave women with them, and were taking them towards the centre of the country to sell them for ivory. It shows that the trade is turning back towards the interior. In passing through the country, I found that the English name had penetrated a long way in. The English are known as the tribe "*that likes the black man*." The Portuguese, unfortunately, had been fighting with them near Tete; but the natives had been aided by half-breeds, and kept the Portuguese shut up at Tete, two whole years. In coming down the river, I knew nothing of this war. Once we saw great numbers of armed men going along the hills and collecting into a large force, and all the women and children sent out of the way. When we got to where they were, some of the great men came to ask what I was? "Are you a Mozungo?"—that is the name they apply to the Portuguese; I did not know it, however, at that time. "No," I said, "I am a Lekoa." "Then," they said, "they did not know the Lekoa." I showed them my arm. I could not show my face as anything particularly white, but I showed my arm, and said, "Have the Mozungo skin like that?" "No, no; we never saw such white skin." "Have they long hair like mine?"—the Portuguese make a practice of cutting the hair short. "No; you must then be one of the white tribe 'that loves the black man.'" "Yes, I am." I was then in the midst of the belligerents, without having any wish to engage in the quarrel. They finally allowed me to pass. Once when we came to a tribe, one of my head men seemed to have become insane and ran away, and we lost three days seeking for him. This tribe demanded payment for leave to pass, and I gave them a piece of cloth. In order to intimidate us they got up the war dance, and we made them another offer, and gave another piece of cloth. But this was not satisfactory, and then they got up their war dance in full armour, with their guns and drums and everything quite warlike, in the sight of our encampment. My men had been perfectly accustomed to fighting; they were quite veterans, but in appearance they were not near so fine as these well-fed Zambesians. My men said to me, "Will you allow us to keep their wives?" They thought they were intimidating us, but my men were perfectly sure of beating them. One of my chief men seemed to be afraid, because they never make a war dance without intending to attack, and got up during the night and said, "There they are, there they are!" and ran off, and we never saw him again.

The country is full of lions, and the natives believe that the souls of their chiefs go into the lion, and consequently when they meet a lion they salute and honour it. In travelling, the natives never sleep on the ground; they always make little huts up in the trees. We had a good many difficulties of the nature I have described, with the different tribes on the confines of civilisation. The people in the centre of the country seem totally different from the fringe of population near the coast. Those in the centre are very anxious to have trade. You may understand their anxiety in this respect when I inform you, that the chief of the Makololo furnished me with 27 men and 15 oxen, canoes, and provisions, in order to endeavour to form a path to the West Coast; and on another occasion the same man furnished 110 men, to try and make another path to the East Coast. We had found the country so full of forest, and abounding with so many rivers and so much marsh, that it was impossible to make a path to the west, and so we came back and endeavoured to find one to the east. In going that way, we never carried water a single day. Any one who has travelled in South Africa, knows the difficulty of procuring water, but we were never without water a single day. We slept near water, passed by water several times during the day, and slept near it again. The western route being impracticable for waggons, we came back, and my companions returned to their friends and relatives. I did not require to communicate anything about our journey, or speak even a word about what we had seen; as my men got up in all the meetings which were held, and told the people of what had passed. One of the great stories they told was, "We have been to the end of the world. Our forefathers used to tell us that the world has no end, but we have been to the end of the world. We went marching along, thinking that what the ancients had told us was true, that the world had no end; but all at once the world said to us, 'I am finished; there is no more of me; there is only sea in front.'" All my goods were gone when I got down into the Barotse valley, among the Makololo, and then they supplied me for three months; and in forming the eastern path, which I hope will be the permanent one into the interior of the country, the chief furnished me with twelve oxen for slaughter and abundance of other provisions, without promise or expectation of payment. At one time it was thought, instead of going down the way we came, we should go on the other or south side of the river. But this river forms a line of defence against the Matabele, where my father-in-law, Mr. Moffat, went. I was persuaded by some to go in that direction. But when I had heard the opinions of all who knew the country, and those who had lived in that direction, I resolved to go north-east, and strike the Zambesi there.

In passing up towards Loanda, we saw that the face of the country was different, that it was covered with Cape heaths, rhododendrons, and Alpine roses, showing that we must be on elevated ground. Then we came to a sudden descent of 1000 feet, in which the river Coango seemed to have formed a large valley. I hoped to receive an aneroid barometer from Colonel Steele, but he had gone to the Crimea. In going back, therefore, I began to try the boiling point of water, and I found a gradual elevation from the west coast until we got up to the point, where we saw the Cape heaths and rhododendrons; then, passing down inland, we saw the rivers running towards the centre of the country, and the boiling point of water showed a descent of the surface in that direction too. This elevated ridge is formed of clay slate. In going north-east, towards the Zambesi, we found many rivulets, running back towards the centre of the country. Having gone thither, we found the elevation the same as it was on the western ridge, and the other rivers, as described by the natives, flowing from the sides into the centre, showing that the centre country is a valley—not a valley compared to the sea, but a valley with respect to the lateral ridges. There were no large mountains in that valley; but the mountains outside the valley, although they appeared high, yet, actually, when tried by the boiling point of water, were not so high as the ridges, and not much higher than the valley.

The President.—Will you describe the White Mountains?

Dr. Livingston.—They lie to the north-east of the Great Falls. They are masses of white rock somewhat like quartz, and one of them is called "Tabacheu," which means "white mountain." From the description I got of its glistening whiteness, I imagined that it was *snow*; but when I observed the height of the hill, I saw that snow could not lie upon it.

The President.—The Society will observe that this fact has an important application.

Dr. Livingston.—I observed to them, "What is that stuff upon the top of the hill?" They said it was stone, which was also affirmed to me while I was at Linyanti, and I have obtained pieces of it. Most of the hills have this coping of white quartz-looking rock. Outside the ridges the rocks are composed of mica and mica-slate, and crystalline gneiss at the bottom. Below we have the coalfield, which commences at Zumbo. Higher up there are very large fossil trees, of which I have brought specimens.

The President.—The point to which I called your attention with reference to the white rocks, is important, as it may apply to the mountains towards the eastern coast of Africa, which have been supposed to be covered with snow, and are commonly called the "Mountains of the Moon." It seems that the range of white-capped hills, which Dr. Livingston examined, trended towards those so called mountains, and it may prove that the missionaries, who believe that they saw snowy mountains under the equator, have been deceived by the glittering aspect of the rocks under a tropical sun. I would also ask Dr. Livingston if he has formed any idea of that great interior lake, which is said to be 600 or 700 miles long; and whether the natives gave him any information respecting it?

Dr. Livingston.—When I was on my way from Linyanti to Loando, I met with an Arab, who was going to return home towards Zanzibar across the southern end of the lake "Tanganyenko," and who informed me that in the country of the Banyassa (Wun' Yassa?) there is an elevated ridge which trends towards the N.N.E. The lake lies west of it, and in the northern part is called Kalague. They cross the southern end of it, and when crossing they punt the canoe the whole way, and go from one island to another, spending three days in crossing. It seems, from the description I got from him, to be a collection of shallow water, exactly like Lake Ngami, which is not deep either, as I have seen men punting their canoes over it. It seems to be the remnant of a large lake, which existed in this part, before the fissure was made to allow the Zambesi to flow out. That part of the country is described by many natives as being exceedingly marshy. The Makoloko went up to the Shuia Lake and found all the country exceedingly marshy, and a large lake seems to be actually in existence, or a large marsh with islands in it. But it can scarcely be so extensive as has been represented, as in that case I must have crossed part of it or heard more of it.

Mr. F. Galton, F.R.G.S.—I should be glad to ask Dr. Livingston, whether, in his route across Africa, he fell in with any members of the Hottentot race. In old maps the northern limit of the Hottentot race is placed but a short distance beyond the Orange River; later information has greatly advanced their boundary, and, in my own travels, I found what appeared to be an important headquarters of that people, at latitude 18° S. There they were firmly established in the land, and were on intimate terms with their negro neighbours, the Ovampo. These Hottentots asserted that their race was equally numerous still farther to the northward of the most distant point I was able to reach, and I have been unable as yet, to obtain any information by which any northern limit to the extension of the Hottentot race can, with certainty, be laid down.

Dr. Livingston.—When I went up to discover Lake Ngami with Mr. Oswell, I found people who have the "click" in their language, and who seem to be Hottentots; they had formerly large quantities of cattle, and intermarry with the Bushmen. Again, two Portuguese of Loanda described to me a people in 12° S. as Bushmen, but I did not see them.

Mr. Galton.—I might mention in corroboration of Dr. Livingston's report of a gradual desiccation of the Bechuana country, that the Damaras entertain a precisely similar belief. They say that within the existing generation, their country has become dried up to a marked extent; hence, without doubt, this same physical phenomenon affects the entire breadth of Southern Africa.

Dr. Livingston.—You not only see remains of ancient rivers all through the country, but you find actually the remains of fountains; you see holes made in the solid rock, where the water has fallen, when flowing out of these fountains, and you find in the sides of some of the holes, pieces of calcareous tufa, that have been deposited from the flowing of the water.

Professor Owen: I have listened with very intense interest to the sketches of those magnificent scenes of animal life, that my old and most esteemed friend, Dr. Livingston, has given us. It recalls to my mind the conversation I had the pleasure to enjoy with him in the Museum of the College of Surgeons, seventeen years ago. I must say, that the instalment which he has given us of his observations on animal life this evening, more than fulfils the highest expectations that I indulged of the fruit that science would receive from his intended expedition. It has, so far, exceeded all our expectations; but it is not only in reference to those magnificent pictures of mammalian life,—that reference is to those new forms of that peculiar family of ruminants, the antelopes; but it is to those indications of the evidence of extinct forms of animal life which interest me still more. I hope some fragments will yet come to us of those accumulated petrified remains of animals, which it has been Dr. Livingston's good fortune, among many very wonderful and unique opportunities of observing nature, to have seen.

Mr. J. Macqueen, F.R.G.S., observed—Lacerda does not give either the longitude or the latitude of Téte. He gives the latitude of Maxenga to the north of Téte, 15° 19′ s., the estimated distance to which from Téte, according to the rate of time in travelling, places Téte, by my calculation, in 16° 20′ s. lat. Dr. Lacerda gives the latitude of the Isle of Mozambique, at the western entrance of the Lupala, 16° 31′ s. Dr. Livingston gives it 16° 34′, a concordance which proves the accuracy of both. Dr. Lacerda's accuracy, thus established, is of great importance, because he gives us two important astronomical observations far to the northward. The first, at Mazavamba, 12° 33′ s. lat., and 32° 18′ E. long., and 20 miles south of the Arroanga of the north, 260 miles from Téte, which is the same river as that designated the Loangua by Dr. Livingston, at its junction with the Zambesi. The second observation was made at Muiro Achinto, now called Chama, lat. 10° 20′ s., and long. 30° 2′ E., from which point Gamitto's daily bearings and distances enable us to fix the capital of Cazembe with sufficient accuracy. Westward of Mazavamba, about 60 miles, is the great mountainous chain of Maxinga, or Muchinga, rising from 16,000 to 17,000 feet above the level of the sea. A branch of it runs N.E., another to the westward, and a third to the S.S.W., by the Zumbo, stretching southward to the mountains of Chidam and those called Mushome.

The accounts of the Embarah are fully substantiated by Brocheda and the journeys of Ladislaus. Embarah is the Aimbara, or the chief tribe and ruler of the great province of Quanhama, situated to the westward of the great river Cubango. This river rises in Nanno, near the sources of the Cunene, but instead of joining that river, as hitherto supposed, it pursues its way on the westward of Bihé to the S.E., and joins the Leambye, and is doubtless the parent stream of the Chobé. This may give a great water communication from the western portion of Bihé to the Indian Ocean, which is important. The land to the east of Bihé is very high. It is, properly speaking, the Libalé. In July and August, the hills are reported to be covered with snow, and the lakes and rivers to be completely frozen over. This degree of cold so near the equator (14° to 15° s. lat.) gives a very high elevation. Ladislaus in his southern journey penetrated to 20° $5'$ s. lat., and 22° $43'$ e. long., at which point he must have been at one time only about three days' journey distant from the point where Dr. Livingston was at that time, and who was probably the white man of a party described as riding on an ox. Ladislaus has also penetrated northwards and north eastwards around the Cassaby to 4° $41'$ s. lat., and 25° $43'$ e. long.

It affords me great pleasure to see Dr. Livingston among us. I have closely followed his journeys since I heard of him on the top of the volcanic Bakkaluka hills riding on the ox, convinced that he would soon send us most important information. Dr. Livingston has travelled more in Africa than any other traveller ancient or modern, while he has laid down with geographic accuracy every point over which he travelled from sea to sea—the Atlantic to the Indian Ocean.

Captain Vardon, f.r.g.s.—I beg to supply an omission which my friend, Dr. Livingston, has made this evening. He has expatiated at great length on the amiability of the African ladies; but there is one lady whom I met in South Africa, and from whom, I believe, many South African travellers, whom I see in this room, experienced the greatest kindness and hospitality. Dr. Livingston has not made any allusion to her, and I rise to do so. This lady, I need scarcely say, is his own wife. I observe here Colonel Steele, Mr. Oswell, Mr. Gordon Cumming, and others, who will bear me out in saying that we received the greatest kindness from Dr. and Mrs. Livingston; their hospitality was unbounded, and I am glad of having this opportunity of publicly thanking them before the Royal Geographical Society. Dr. Livingston has said, with his usual modesty, that he has not done much, that any of us might have done as much. I beg to differ from him. As to my own small excursion on the Limpopo, after what I have heard to-day, I feel so ashamed of myself, that I fancy I have only just returned from Blackheath.

Colonel Steele, f.r.g.s.—My travels in South Africa were much like Captain Vardon's. Dr. Livingston was my earliest companion in Africa, but we travelled such a short distance in company, that I am afraid any remarks I could offer, beyond again returning my best thanks to Dr. and Mrs. Livingston for their hospitality, would be of no importance to the Society.

The President.—Colonel Steele's modesty has prevented him from stating that without the instruments with which he had provided Dr. Livingston, he could not have made the excellent observations which have been obtained.

Mr. Gordon Cumming begged to confirm what Captain Vardon had said with respect to the kindness with which Dr. Livingston received all parties who visited him. He was not aware that Dr. Livingston had alluded to the insect (the tsetse) whose bite is fatal to cattle. One year, while hunting in the mountains, he, Mr. Cumming, lost all his horses and oxen from the bites of this fly, and if it had not been for the kindness of Dr. Livingston in at once sending him his own cattle, he would scarcely have been able to have extricated himself from his dilemma and returned to Europe.

Mr. J. Crawfurd, f.r.g.s.—Perhaps Dr. Livingston will have the goodness to give us some notion of the state of society among these people, especially among the tribes that inhabit the plateau valley. That ought to be a place in which there is a considerable civilization with a decent form of government. They seem to have many advantages, an excellent climate, excellent soil, and an excellent supply of water. What is the state of the arts among those people? Do they understand the art of making malleable iron or steel? Do they know the use of any other metal, or the use of alloys, as those of copper? Can they weave, or make bread? What plants do they cultivate? And what are they likely to produce in exchange for our merchandise? I strongly suspect, from what Dr. Livingston has said respecting the women, that the great portion of the labour, even of the field, is left to them, and is not performed by the men, otherwise how could the women be able to feed the men? They must work in order to procure that with which the men are fed. I expect the men are idle and the women laborious. Some men would appear to have as many as five wives. How come they to monopolise so many?

Dr. LIVINGSTON said: The new articles of commerce that I observed are chiefly fibrous substances, some of them excessively strong, and like flax. They abound in great quantities on the north bank of the Zambesi. There are also great quantities of a tree, the bark of the root of which is used by the Portuguese and natives as the Cinchona. It has been employed in fever by the aborigines of the country from time immemorial, and both the Portuguese and my companions and myself found it very efficacious. It is remarkable that where the fever most prevails, there the tree, which I believe to be a cinchona, abounds. It seems the remedy is provided for the disease, where it prevails most. Now, in connection with the opening up of this river and the fever, I have seen on the banks of the Zambesi whole forests of this Cinchonaceous tree, particularly near Senna. A decoction of the bark of the root has been found to act exactly as quinine: it is excessively bitter, and may prove a good substitute. There is also Calumba root, which the Americans purchase, to be used as a dye, and it is found in large quantities. A species of Sarsaparilla is to be found throughout the whole country. The sugar-cane grows abundantly, but the natives have no idea of sugar, although they have cultivated the cane from time immemorial. The chief of the Makololo sent about thirty elephant tusks down to the coast, and gave me a long list of articles, which I was to buy for him in the white man's country. As I had been entirely supported by him for several months, I thought it my duty to accept his commission, and I intend to obtain these articles for him. Among other things he ordered a sugar-mill. When he found that we could produce sugar from the cane, he said, "If you bring the thing that makes sugar, then I will plant plenty of cane, and be glad." Then, again, indigo grows all over the country in abundance. The town of Tete has acres of it; in fact, it is quite a weed, and seems to be like that which grows in India, for before the slave trade became so brisk indigo was exported from Tete. The country also produces the leaves of senna, and, as far as I could ascertain, exactly like that which we import from Egypt. There is plenty of beeswax through the whole country; and we were everywhere invited by the honey-bird to come to the hives. Any one who has travelled in Africa knows the call of the honey-bird. It invites travellers to come and enjoy the honey, and if you follow it, you are sure to be led to the honey. Some natives have given it a bad character. Sometimes, when a man follows the bird, he comes in contact with a lion or a serpent, and he says, "It is a false bird, it has brought me to the lion." But if he had gone beyond the lion, he would have come to the honey. The natives eat the honey and throw the wax away. In Angola it is different. There, a large trade in wax is carried on, and the bees are not so numerous as in the eastern parts of the country; but here they have no market. It was the same with ivory when Lake Ngami was discovered. They will not throw away an ounce of it now. Then, again, there are different metals found. There is a very fine kind of iron ore; and at Cazembe there is much malachite, from which the natives extract copper. Then there is gold round about the coal-field, and gold has been procured by washing from time immemorial. In former times the Portuguese went to different places for gold with large numbers of slaves. It was before the time of the great exportation of slaves began. The chiefs had no objection to their washing for gold, provided they gave a small present first. Then there is coal near Téte; no fewer than eleven seams exist, one of which I found to be 58 inches in diameter. The coal has been lifted up by volcanic action. There is also a hot spring there. The thermometer stands at 160°. The coal from two of these seams could be easily exported, as they are situated on a small river, about two miles below Téte, and the coal could with very little trouble be brought down. When you go up the Luabo, or largest branch, the river is rather narrow, but as you ascend it gets much broader. The Mutu is another river that joins the Zambesi. At the point of junction of the Mutu or Quilimane river with the Zambesi, the beginning of the Delta, that river is three-quarters of a mile broad. When I passed down to that point it was a deep, large river, as it was then full. The Portuguese tell me there is always a large body of water in the river, during certain months in the year. This great body of water, spread over a large space, is in the dry season shallow, except in the channel, which is rather winding. At some seasons the channel changes its course. There are many reedy islands in it, and these are sometimes washed away. During five months of the year there is plenty of water for navigation, and during the whole year there is water enough for canoes. A vessel of light draught like the Portuguese launches, could go up to about 20 miles beyond Téte with the greatest ease, during those months. At Kebrabassa in Chicova, there are rapids, caused by certain rocks jutting out of the stream. I did not see them, as we were obliged in our descent to leave the river, on account of the rivulets being filled by the large river coming into flood, and to pass down by land all the way from the hill Pinkue to Vunga, and thence to Téte. There is another rapid called Kansala. Beyond that the river is smooth again, until you come to the "Great Falls of Victoria," where it would be quite impossible for any one to go up, as it is a deep fissure or cleft.

Mr. Consul Brand, f.r.g.s.—I am unwilling to be altogether silent on the present interesting occasion, having resided a good many years in that part of the West Coast of Africa which Dr. Livingston visited, and where our Associate Mr. E. Gabriel still resides. I had been obliged by ill health to leave the country shortly before Dr. Livingston's arrival; but the Doctor could not have fallen into better hands than into those of Mr. Gabriel. It was from a letter addressed by Mr. Gabriel to Lord Ellesmere, that this Society first heard of Dr. Livingston's arrival at Cassange. Mr. Gabriel immediately sent an invitation to the Doctor to take up his abode with him, during his stay at Loanda, and at his house the Doctor and his faithful companions found a home. The Doctor's first Report from Loanda to the London Missionary Society, was written at his sick-bed by Mr. Gabriel's own hand. He accompanied the Doctor part of the way on his return journey through Angola, and from that time up to the present, I have been in the habit of receiving from him letters manifesting the deepest interest in the Doctor's progress in the interior of Africa. I wish to mention these facts in justice to Mr. Gabriel, because on my arrival the other day in England, I received a letter from him simultaneously with Dr. Livingston's arrival, in which he expresses the utmost anxiety for the Doctor's safety. I have written, and a letter is now on its way to Loanda, announcing the Doctor's safe arrival among us. But it is not only to Mr. Gabriel that I would allude; for when Dr. Livingston arrived at Loanda, I was delighted to hear how he had been received by the Portuguese. I resided nearly nine years among this people, and I can testify that I never received greater acts of kindness from any other nation, than from them. I had among them some of my best friends, whose friendship was unequivocally tested under trials and in sickness, and I was delighted to hear that the same kindness which I had experienced at their hands had been experienced by Dr. Livingston. I am glad to have this opportunity of testifying, in the presence of the Portuguese Minister, my gratitude for the kindness I received from his countrymen during my residence in the Province of Angola.

But the consequences resulting from Dr. Livingston's journey, are calculated to contribute so much to the interests of the Portuguese African Colonies, that I am sure in time, they will be more than repaid for the kindness they showed him. Dr. Livingston's arrival at Angola I look upon, as one of those opportune events, which sometimes have an important influence on the destinies of a country; at no period could such a visit have been more fortunate. The minds of men were unsettled in consequence of the depressed condition of the peculiar traffic which had so long been paramount, and the attention of thinking persons was turned to legitimate trade and the development of the resources of the country. Farther, the Portuguese Government had passed a measure for registering and gradually emancipating the slaves in their colonies. Those who take an interest in the progress of the African race will be glad to hear of this fact.

Dr. Livingston arrived about this time, and showed that by opening up a communication with the interior of Africa, a rich trade might be carried on, that would more than compensate for the loss the colony was likely to sustain from the abolition of the slave trade. The Doctor prophesied that, very soon after his journey had become generally known, an attempt would be made on the part of the tribes in the interior, to communicate with the coast. This prophecy has been fulfilled; for I learn from a communication from Mr. Gabriel that a caravan of negroes, fitted out by Sekeletu and led by one of the Arabs, who crossed from the coast of Zanzibar to Benguela in 1851, had arrived at Loando by way of Bihé. This expedition has not, it would seem, been very profitable, owing to causes incident, I should hope, only to first attempts; but I trust that experience will render the next more successful. I shall not, at this late hour, read Mr. Gabriel's very interesting communication, but limit myself to stating the fact it announces, which proves that the inland tribes are anxious to open up a communication with the coast, and shows how correctly Dr. Livingston calculated the result.

I wish to mention another result of Dr. Livingston's visit. At Loanda we had but one small newspaper; the Doctor wrote a series of articles for it, which appears to have stimulated a literary tribe, and you here see the 'Loando Aurora, a Literary Journal,' printed at the Government press, and, I believe, one of the fruits of Dr. Livingston's visit to that city.

The President.—I have now only to congratulate the Meeting upon having received so much instruction from Dr. Livingston. I may well say he has communicated to us the outlines of a book, which I hope will soon be published for the information of the British public. I am glad to add that there is no person fuller of gratitude to the Portuguese than Dr. Livingston himself. If he has not here expatiated upon that subject, I can testify that in private letters which he has addressed to me, he has uniformly dwelt upon the very kind and liberal conduct of the Portuguese Authorities, officers, and people to himself and party. He was also most kindly received by General Hay, commanding Her Majesty's forces in the Mauritius, and restored to health by the hospitality of our countryman.

The Resolute.—The President finally announced to the Meeting that, at the request of the Council, he had invited Captain Hartstene and the American officers of the 'Resolute' to dine with the Society prior to their departure from this country. The day had not been appointed as yet, as Captain Hartstene had been suddenly called to his ship—Her Majesty the Queen having signified her intention to visit the 'Resolute' on the next day.

Fifth Meeting, Jan. 12, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Colonel Smyth O'Connor, John Palliser and J. D. Crum Ewing, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Captain G. H. Richards,* R.N.; *Captain D. J. Herd; Lieutenant Fairholme,* R.N.; *Clarence Braddyll; James Crawford; E. Auchmuty Glover; Charles L. Gruneisen; Edw. Terrick Hamilton; Francis Nares; George Nelthropp; Henry Nesbitt; William Peters; W. G. Smith; John M. Teesdale; and Henry Tudor, Esqrs., were elected Fellows.*

DONATIONS.—Among the more important donations presented to the Society since the last meeting, were 'The Atlas of the Government of Tver,' executed under the superintendence of General Major Mendt, and presented by the Imperial Geographical Society of St. Petersburg; Papers containing historical and other information relative to ports and places in and about the Persian Gulf, presented by the East India Company; the 'Red River of Louisiana,' by Lieut. Marcy, U.S. Navy; Sitgreave's 'Expedition to the Zuni and Colorado Rivers,' presented by General Mercer; 'Supplement to Dr. Blackie's Imperial Dictionary;' the Transactions of various Societies, &c.; Stanford's Maps of London, with New Postal Sub-Divisions, &c.

The Livingston Testimonial-Fund Papers were laid on the table.

ANNOUNCEMENTS.—The PRESIDENT said, with reference to the dinner offered to Captain Hartstene and the American officers who brought home the 'Resolute,' if it had been possible for those gentlemen to have accepted the invitation, he had every reason to believe, from the spirit shown by the Fellows of the Geographical Society and their numerous friends, that it would have been one of the most effective and numerously attended meetings, ever given in the Metropolis by any Scientific Body. He regretted that it did not comport with the arrangements of Captain Hartstene and his brother officers, who had expressed themselves quite overcome by English hospitalities, to accept the invitation which emanated from the Geographical Society.

Capt. Hartstene.—After the ballot had been taken, the PRESIDENT said, he held in his hand twenty-seven proposals for the admission of Candidates into the Society. It was a remarkable event; one which had scarcely occurred in any Scientific Society in the metropolis. The first on the list was an Honorary member; and he was sure the members would agree with him that the Council had done right in proposing that Captain Hartstene, of the United States Navy, should be an Honorary member.

The papers read were—

1. *Proposed Exploration of the River Orinoco, &c.* By Rear-Admiral Sir CHARLES ELLIOT, late Governor of Trinidad.

Communicated by Sir RODERICK I. MURCHISON.

AN officer administering the government of a British colony, situated within a few hours' steaming of the mouth of the Orinoco, would naturally recur with interest to Humboldt's account of his explorations in that river, of its intersection with the majestic Amazon, by the confluence of the waters of the Cassiaquare and the Rio Negro, a great affluent of the Amazon, and of the still shorter means of connecting these two stupendous river systems, comprising, according to that great authority, a surface of 190,000 square leagues, by the easy opening of a canal of 7 or 8 miles long, at the Isthmus of Tuamini, situated between the headwaters of the river of that name, falling into the Orinoco, and the Rio Negro into the Amazon. In that voyage of 75 days and 1500 miles, in a pirogue of scarcely three feet breadth, which had its commencement at San Fernando on the Apure, and closed at Angostura on the lower Orinoco, Humboldt and Bonpland collected not merely a body of scientific observations, which in point of amount, variety, and value, have never been exceeded by any travellers, but Humboldt enriched the narration with reflections and indications of unsurpassable practical importance.

No investigations could be more worthy of the reputation of this great country, or more conducive to its vast commercial interests, than those to which Humboldt has called attention in that part of his narrative, in which he describes his voyage, setting out at San Fernando on the Apure, to its confluence with the Orinoco; up that stream, from that point, as high as San Fernando de Atabapo, across the short portage from the Tuamini to the Rio Negro, occupying four days-journeying in the forest; down that noble affluent of the Amazon to the Brazilian frontier at St. Carlos; thence retracing their course to San Fernando de Atabapo by the way of the Cassiaquare and Orinoco, thus establishing the connection of these two great river basins:—

> "Depuis que j'ai quitté les bords de l'Orinoque et de l'Amazon," says Humboldt, writing in 1812 or 1813, "une nouvelle ère se prépare pour l'état social des peuples de l'Occident. Au fureur de dissensions civiles succéderont les bienfaits de la paix, un développement plus libre des arts industriels. Cette bifurcation de l'Orinoque, cette isthme de Tuamini si facile à franchir

par un canal artificiel, fixeront les yeux de l'Europe commerciale. Le Cassiaquare, large comme le Rhin, et dont le cours a 180 milles de long, ne formera plus en vain un ligne navigable entre deux bassins des rivières qui ont une surface de 190,000 lieues carrées. Les grains de la Nouvelle Grenade seront portés aux bords de Rio Négro; des sources de Napo, et de l'Ucaylé, des Andes de Quito, et du Haute Péru, on descendra en bateau aux bouches de l'Orinoque, sur une distance qui égale celle de Timbuctu à Marseilles; un pays neuf, à dix fois plus grand que l'Espagne, et enrichi des productions les plus variées, navigable dans tous les sens par l'intermède du canal naturel du Cassiaquare, et du bifurcation des rivières. Un phénomène, qui sera un jour si important pour les relations politiques des peuples, mérite, sans doute, d'être examiné avec soin."

In the Atlas accompanying the narrative, published by Humboldt at Paris in 1814, he gives a map of the course of the Apure, from its headwaters to its confluence with the Orinoco, and it is impossible to peruse his account of the countries, and the rich and varied products attainable through that line of navigation, without recognizing the force of his reiterated notice of the prospective value of that stream of trade and intercourse. But he presses still more urgently on the importance of the navigation of the Meta, which he compares with the Danube not in length, but in volume of water; and he also furnishes a map of this river in the Atlas. He describes it to have a navigation of at least 400 miles from its confluence with the Orinoco to its connection with the streams which descend from the table-lands of Santa Fé de Bogotá, and all the richest regions of New Grenada. From the Embarcadero on the river San Juan, falling into the Meta, the distance to Bogotá by the valleys of Apiay and Caqueza does not exceed 10 leagues. In point of shortness of land-travel, between navigation and the tableland and all other conveniences of trade, there seems reason to think that the route to Bogotá by the Meta would soon displace that by the Magdalena, the basin of which is comparatively of very inferior importance.

When the Orinoco and its affluents, especially the Meta, are well opened up by steam navigation, it is in the highest degree probable that Humboldt's view respecting the wheat supply of the continental shores and the islands of the Caribean Sea will prove to be correct. They will easily draw that supply from Cundinamarca and the rich tablelands of New Grenada. Indeed, in years of comparative scarcity in Europe and the northern parts of America, these great streams may be freighted with heavy supplies of corn destined for these shores, and for those of the United States of America. In those surprisingly fertile soils and genial climates, men reap at the seasons when we sow, taking off two crops annually, of weight per acre almost, if not quite equal, to the best cornlands of Europe;

returns, it should be said, to cultivation, which would hardly deserve the name in this country.

Nothing can be more certain, than that judicious steam navigation on the Orinoco and its affluents, would soon show steadily increasing returns to capital. The regions drained by that system are incalculably rich in vegetable and mineral resources. The lower lands teem with tropical products and cattle; the valleys of the mountainous districts, and the table-lands, have the climate of temperate regions with the vigour of a tropical sun, and a soil of surpassing fertility. I asked Mr. Clay, many years since, in a voyage which we made together on the Mississippi, what he thought it would be reasonable to compute steam navigation had done in accelerating the settlement of that basin. He replied that he had often reflected on that subject, and he considered it scarcely an exaggeration to say that if it had pleased God to create those vast regions with all their present productive powers, but with no great watercourses rolling through them until many hundred years after they had been partially inhabited, the consequences could hardly have been more wonderful than those which had followed within his own short scope of observation, since the first establishment of steam navigation on the Mississippi and its affluents. But what is the basin of the Mississippi and its affluents, to the united basins of the Orinoco and the Amazon? Insignificant indeed, in every respect of area, and variety and value of natural resource.

It has often occurred to me, during my residence at Trinidad, that when the enthusiastic and heroic Raleigh sought, or feigned to seek, his El Dorado up the Orinoco, it could hardly have failed to strike that brilliant imagination, that he was upon the track of an El Dorado of far deeper significance, and more inexhaustible streams of wealth, in the truest sense of that word, than those mountains of gold, and cities and palaces paved with precious stones. The realisation of all the promise of that wondrous tale, would be poor indeed in comparison with the results of those grand and wise plans of Humboldt, founded, not upon impulses of cupidity, or visions of conquest, but on the sober deductions of exact knowledge, and the sure consequences to flow from the dissemination of the arts of peace, of commerce, and the endless train of civilization and improvement. "Rivers," says Pascal, "are roads that run, and lead us where we will;" and when we consider that this amazing network of waterpaths, longer by thousands of miles than the circumference of the globe, has its nearest exit to the shores of Europe, almost within sight of a British possession, it is certainly an abashing reflection that more has not been done to avail ourselves of these advantages. Speaking as a professional man and with some experience of the spirit and purpose of a great maritime rival, I am persuaded it is a sound opinion, that the Government of this Empire cannot too constantly encourage the enterprise of travel in outlying regions, and most especially waterborne travel. A former President of the United States is reported to have said with more roughness than reverence, that if there were a bag of coffee in the mouth of an unmentionable place, there would be found a countryman of his to go and trade for it. It would not be recommendable to follow any leading to that destination for coffee or any other commodity; but in all rational and honourable maritime undertaking on the face of this planet in the pursuit of knowledge, it is a matter of high policy that this nation should lead, and strive to pass beyond the rest of mankind. Most honourable is it to the successive Boards of Admiralty, since the close of the long war, that we have done so both in the Arctic and Antarctic, for assuredly we had better have lost ten sail of the line in battle, than that any other nation should have vanquished us in those perilous investigations. Their priceless result has been the maintenance of the spirit and genius of the Navy.

The practical preliminary step which has suggested itself to me, is that Her Majesty's Government should be led to move the Governments of New Grenada and Venezuela, on the part of the Royal Geographical Society, to authorise and second the resumption of Humboldt's scientific investigations on the Orinoco and its affluents. With that permission granted, I would submit that the expedition should be assembled at Trinidad, in two or more vessels of suitably light draught and power, and set out from that island at the right time of year; regard being had to the rains, rise of rivers, &c. Immediately below the mouth of the Meta there are rapids. It is possible, however, although there is plenty of water in the narrow channels between the rocks, and Humboldt represents that there is no real danger with a good pilot, that it might be desirable for the permanent navigation of the Meta, that the line of boats should be separate, so as to avoid the rapids, unless indeed they could be easily turned by a slack water navigation.

Our situation at Trinidad, lying at the very threshold of this mightiest highway for the transit of commerce and civilisation, would greatly facilitate the steady prosecution of these deeply interesting explorations.

COLONEL SMYTH O'CONNOR, F.R.G.S., said he had resided many years in Trinidad, and had been up the Orinoco. The views of Admiral Elliot were of the greatest consequence to the British colony. He had no doubt that Trinidad, Tobago, and the other islands off the Spanish Main, originally formed part of the South American Continent, but had been torn from it by the vast volume of the Orinoco, and divided into islands. Twenty-two years ago Colonel Hamilton navigated the Orinoco up to Angostura. At that time he was engaged with the Columbian Government, and had received near Angostura the grant of an immense tract of land, enclosed by mountains on one side, and bounded by the river on the other. He cultivated corn and a variety of other produce which he exported to Trinidad. But the chief production was cattle, reared from importations obtained from Spain, England, and Scotland, and so great was their value that horses sold at Trinidad for nearly 400 dollars, or 80*l.* sterling. That island was supplied with mules chiefly from the Orinoco, from near Angostura.

MR. JOHN LEE, F.R.G.S., suggested that the Government should send some steamers up the river to make a proper survey, and obtain statistical information as to the productions of the country. An expedition of this nature was not likely to be carried out by private enterprise.

The PRESIDENT replied that this was the course proposed by Admiral Elliot. The object of his communication was to have the subject properly discussed, and if considered desirable, that the Council of the Geographical Society should recommend the plan to Her Majesty's Government. He should like to hear the opinions of commercial gentlemen on the subject, and he thought it fortunate that they had present a gentleman of Colonel O'Connor's information to justify the application of Sir Charles Elliot.

2. *Account of the Search for the North-Australian Exploring Expedition under Mr. A. C. Gregory.* By Lieut. W. CHIMMO, R.N., F.R.G.S.

Read, Jan. 12, 1857.

FROM accounts received from Sydney, N.S. Wales, in February 1856, the Secretary of State for the Colonies had serious apprehensions for the safety of the North Australian Expedition; and having applied to the Admiralty for an officer to lead a searching party, I was selected for this mission, and with two hours' notice to prepare, embarked in the 'Royal Charter,' which was on the point of sailing for Melbourne, and made the passage—one of the quickest on record—in 59 days and 6 hours.*

On arrival at Sydney, a delay of two months occurred. I remained waiting instructions from the 19th of April to the 18th of June. After the searching party was collected and organized, I received instructions from his Excellency the Governor General to proceed in the 'Torch,' which had been chartered from her new owners, "*First*, to the Albert River, whence, after making a minute search, and feeling satisfied that they had not yet arrived there, to proceed *secondly*, to the Victoria River and render every assistance that their condition required."

On June 24th, 1856, the 'Torch' left Newcastle, after having been crammed with 150 tons of coal, or 70 more than she had ever carried before; for which reason the Inner Route to Torres Strait was chosen, where, at all events, smooth water was certain.

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* Lieut. Chimmo had just returned from Australia, where he had been employed in the 'Torch' steamer in surveying the coasts.—ED.

On July 17th I went as close as prudent to the coast about Albany Island and Cape York, to view a spot on which I hoped soon to see an English flag. It was impossible to pass it without feeling how well adapted the island seemed for a preparatory penal establishment, or until our knowledge of the effect of the climate on European constitutions, was more truly and generally known in the depths of the Gulfs of Carpentaria and Cambridge.

Albany Island.—We first passed a bold and regular land of about 400 feet in elevation, nearly three miles long by one broad, lying in a N.W. and S.E. direction, having smooth grassy slopes with valleys of trees, terminating on the S.W. side in rocky cliffs and bold headlands, having on its N.E. side a pretty group of small islets. Here we saw but one canoe, with seven men in it.

Should an establishment ever be decided on, and which has been some time in contemplation, on account of the increased traffic through Torres Strait, for coal depôts for steam communication, as well as a refuge for the shipwrecked mariner, which latter has become so necessary, I have not seen any spot better adapted than this, particularly in a geographical point of view, a commanding position, and exposed to a healthy brisk S.E. trade for half the year. How the N.W. monsoon affects it, I know not. Many would be the benefits arising from an establishment at Cape York or Albany Island, particularly as Port Essington, from its unhealthy site, has been abandoned.

It would benefit the natives, who may be made tractable, as at Port Curtis, Wide Bay, &c., a home or refuge for the shipwrecked sailor could be established. At present he proceeds to Booby Island, where, if his patience be exhausted, he makes a desperate effort to reach Copang. Stores of various sorts for shipping would find many a purchaser, as scarcely a vessel comes through the Barrier without loss of anchors or spars.

Cape York is not so attractive as Albany Island, and is objectionable from being partly surrounded by shoal-water bays. It is particularly barren in appearance. Fresh water is abundant in Evans Bay, two miles from Albany Island.

On arriving at Booby Island on the 18th of July, and searching all the documents in the Post Office there, it was ascertained that Gregory and his party had not passed that way on their return to Sydney. After rating the chronometers and leaving notices for any of his party who might call there, the 'Torch' sailed for the bottom of the Gulf of Carpentaria, passing through its centre. The bar of the Albert River not allowing the 'Torch' to pass, I proceeded in her boats on the 2nd of August to ascend the river, and after a minute search of six days, came to the conclusion that neither Gregory, nor any of his party, nor the vessel in attendance on them, had, as yet, arrived there.

On arriving at the source of the river, 54 miles from the ship, we all took a searching stroll to the "plains and lands of promise," which did not present to me that boundless luxuriance I was led to expect, the whole country being parched and arid. The long grass had been recently destroyed by fire; the large gum and acacia trees, except those overhanging the river, wore quite an autumnal aspect; the land was furrowed and torn away by the deluge of rains during the N.W. monsoon; huge trees were torn up by the roots, depositing the finest of the soil in the river, and leaving on the surface a few flattened porphyritic stones, with quantities of small perfectly sound ironstone particles. Whether the fires which destroy the grass, and eventually the trees, are accidental or intentional, I cannot tell; but I believe the natives frequently set fire to the grass to seize their prey, such as kangaroos, snakes, &c. In fine, I was not very favourably impressed with either the importance of the stream or the richness of the country, although I saw it under the most favourable circumstances, the winter and S.E. trades. What it must be in the summer, during the north-west monsoon, during hot winds and changeable weather, I would hardly venture to say; the thermometer in the shade was max. 72°, min. 56°, in the sun 134° 5; the amount of ozone was 1 to 3.

I placed notices on every conspicuous portion of the banks of the river, to inform Mr. Gregory that he was not forgotten, and that we were in search of him to give him a fresh supply of provisions and ascertain his wants.

We had but one interview with the natives. On descending the river, in turning one of its bends, up started eighteen, whose numbers soon increased to twenty-eight. They were all armed with spears, boomerangs, waddies, and shields, and were exceedingly noisy and clamorous; so much so that I expected every moment to see a boomerang, which the chief or spokesman held in his hand, whirled at us. I ordered two muskets to be held in readiness, in case he should have temerity enough to throw it. They endeavoured by the most exciting gestures to persuade us to land, but this I would not permit, fearing a collision in their angry moments. I, however, made signs to them to retire a short distance, except the chief, when I would land and speak to him. This they did, and they all sat down on a small elevated spot and watched most intently our proceedings. I then backed the boat in, and gave the chief, biscuits, pipes, tobacco, and fish-hooks. He also obtained a large coloured pocket handkerchief, which nearly distracted him with joy; wrapping it round his head and waist, and dancing most vigorously on his heels in the mud, sinking at every jump up to his knees. Their anger had now subsided, and they appeared pleased. I cannot tell what this demonstration of violence could be owing to, and I dreaded any act of hostility for the sake of those coming after us. In some of these natives I observed the loss of the eye-tooth, which indicates that they had arrived at the age of puberty, generally 16 to 17. Horizontal scars, along the body, were also seen, 5 to 6 inches in length, gradually decreasing from the chest downwards. Circumcision was also general. There were no women among them, which was a sure sign that their visit was not intended to be friendly. They followed us for 15 miles along the banks, until a creek prevented any further communication. We gave them some parting presents, including another coloured handkerchief, and they brought their weapons to barter freely and eagerly. I was glad when they turned their backs on us, evidently pleased at the meeting. Every expedition that had visited these shores had suffered from the treachery of the aborigines, and I should have exceedingly regretted if any circumstance had occurred which would have left a bad impression or kept up any spirit of revenge on those so soon to follow in our footsteps.

For 12 miles, on first entering the river, nothing can be seen but a dense mangrove bush on either side, growing on soft mud. Beyond this, the monotony is slightly changed by the elevated appearance of some gum and acacia trees. Then, where the river is deflected in a south and south-west direction, bare patches of cliff from 10 to 30 feet in height, separate the mangroves and diversify the scene. Small mangrove islets with sandy spits, at low water, appear. When nearly 40 miles up the river, a change is altogether met with; the mangroves are separated by various gums and acacias, with an occasional palm-tree. On the borders of the river, bamboos, rushes, creepers, and long grasses form altogether a dense and diversified foliage. The river is, in general, tortuous, and presents when low, a far different aspect to that at high water. Snags, sand and mud banks, embryo islets, forming round sunken logs, are, at high water, all covered, and an unbroken surface is presented.

I visited the Bountiful Island and Sweers Island of Flinders. At the former we found turtle abounding on the beach and in the lagoons among the coral reefs, 60 of which were taken upwards of 3 cwt. each. In my notices, I informed Mr. Gregory of this fact, and recommended his sending the vessel there, if in want of fresh provisions. I also found in a hard, sandy patch, on nearly the centre of this island, the bones of five persons, who had either died of starvation or had been buried there. They all lay in the same position with heads to the north; I do not think a grave had been dug, but that the drift sands had accumulated about the bodies, and formed one grave. They had no spears, arms, or any implements near them. A few turtle-bones, shells of the haliotus and helix, were in heaps around. There was not a jaw to be seen with the upper tooth extracted, which is the custom among the North Australians when they arrive at puberty. This circumstance made me conclude they were not aboriginals, but probably a portion of the crew of the Malay proa we had found wrecked on Sweers Island. The North Australians generally bury their dead on trees, or in caves, wrapped in bark or matting, and with their heads to the east, and have always some of their war or fishing implements near them. No indications of these funeral ceremonies were near these skeletons, of which I have preserved one head for examination.

On Sweers Island, the fresh-water well of Flinders was destroyed by the natives; not, I believe, intentionally, but accidentally, from constantly running in and out to draw water. The well dug by Captain Stokes of the 'Beagle,' was also destroyed, but proving to be in the best position, I had it redug and cleared, and we obtained five tons of water from it, and left a notice also to show the Australian expedition where they would find it; planting near and about it pumpkin-seed, onions, and Indian corn. The natives were few and very shy. If they, who were watching us most intently from Bentinck Island, were surprised at seeing a ship under sail like the 'Beagle,' what must have been their wonder when they saw the 'Torch' move through the water by smoke? There was not a native seen on Sweers Island, although there were many there, and their not coming near us may be possibly attributable to fear at so wonderful a structure, moving without the aid of sails or wind.

About a mile east of this well, we found the remains of the 'Investigator's' well, completely blocked up, having only a slight undulation to mark its spot. We halted under the "tree," which still plainly bore the inscriptions of the 'Investigator' and 'Beagle,' the former carved 54 years since and the latter 15. Fortunately I had a bottle in my bag, and I made all heave-to under the tree and join in drinking with a glass of the "Queen's own" to the memory of the adventurous and intrepid Flinders, and to the health of the next follower of his footsteps, Captain Stokes, R.N., to which was added, as a matter of course, "three cheers."

On our return to the well, we picked up a piece of a lower-deck mess-plate (china), and also a metal tray or inkstand, of European manufacture, the lid of which was gone. It is about 9 inches long, by 5 wide and 3 deep, figured on the outside with leaves of a tree that would puzzle a botanist. Such a thing could scarcely have been left there by the 'Beagle;' and if in the hands of the natives for fifty-four years would have been destroyed if left there by the 'Investigator.' The well, for which we are indebted to the 'Beagle's' visit fifteen years since, we found to be 25 feet deep, the water dripping into it through a rock of concreted lime, sand, shells, and pebbles. Sweers Island is low, thickly wooded with gums, acacias, and a straggling pandanus, and dense grass; the soil is capable of producing Indian corn, yams, cotton, &c. This, with Bountiful Island, would make good headquarters for an exploring party, and I hope Gregory will find it out.

I again passed out of the Gulf of Carpentaria, the greatest depth of which is 46 fathoms, with a soft, adhesive mud, gradually decreasing its depth from the centre to the low, muddy mangrove shores which border the east and south of the Gulf. The only phenomenon worthy of remark was the difference of the density of the sea-water at the depth of the Gulf and at its entrance in lat. 13°, amounting to 7° 7′.

On the 26th of August, we entered the Victoria River, after carefully and anxiously, but unsuccessfully, searching the north coast between the Gulfs, more particularly Treachery Bay, where the expedition first landed, and where Captain Stokes was speared and so nearly lost his life. On my first anchoring in the river, I observed a mark erected on Entrance Island, and near it a bottle containing a notice that the portion of the expedition in charge of Mr. Gregory had left for the Albert River on the 21st of June, and that the schooner 'Tom Tough' had gone to Coepang, in Timor, for repairs.

It was now very evident that my detention for two months at Sydney, might be seriously felt by the expedition. Had I set out on my first arrival, I should have been in sufficient time not only to supply the party with provisions, stores, and despatches, but also to have discharged the schooner and have acted in concert with Gregory, in a steamer, until the completion of his mission.

I proceeded 60 miles up the river in the 'Torch,' and then 40 miles farther in the boats, to Gregory's abandoned camp, where I found another notice of his movements.

After replacing these notices, and [illegible] movements [illegible] ship, and found that [illegible] an interesting [illegible] tree nearest the well [illegible]:—

"This river was discovered by [illegible] on the 15th Oct. 18[illegible], and was named the [illegible] Her Majesty, the Queen of England."

Here I had the good fortune to find [illegible] bower-bird's nest [illegible] scarcely above high-water mark at springs.

On arrival at Gregory's camp, [illegible] miles below Steep Head, we found it looking like an English farmyard, with [illegible] huts, sheep-pens, horse-sheds, forge, [illegible] &c. The spot was well selected. We landed on a pier formed of large stones and pigs of ballast. In our road lay iron hoops, rope, [illegible] old clothes, Indian corn, old boots and shoes, pieces of harness, and we came to the oven, in the interior of which, protected by four pigs of iron ballast, was a bottle, containing a notice to the following effect:—

"Camp, Victoria River.

"On Saturday, 21st June, 1856, the exploring party of the N. A. Expedition, consisting of seven persons, left this camp on their way to the Albert River, in the Gulf of Carpentaria; and on Wednesday, July the 2nd, the remainder finally abandoned the camp and proceeded down the river to join the schooner 'Tom Tough,' which had dropped down to Shoal Reach about three months previously. The vessel will sail, as speedily as possible, to Timor, whence, after obtaining supplies, she would proceed to the Albert River, and the detachment of the Expedition on board will form camp and await the arrival of Mr. Gregory. Subsequent information will be left on Entrance Island.

"John Finlay, carpenter of the schooner, died April 22nd, 1856, and is buried near a gouty-stem tree, marked, with the dome, bearing W.N.W. ½ a mile (Tuesday evening the 1st of July).

"The finder of this document will greatly oblige the Expedition by giving it every publicity, and, if possible, by forwarding it to his Excellency, the Governor of New South Wales, or to any other of the Australian colonies.

(Signed) "T. BAINES."

After perusing this, we went to the forge, where another paper was buried, containing a similar notice. We returned to Mr. Gregory's hut, and, having drank success to his expedition, read all the interesting notices over and over again.

I passed an hour at the camp, admiring all the arrangements. It consisted of seven thatched houses, three huts, some sheds for cattle and sheep-pens, two deep and good wells, and an entrenchment all round. No natives had been near the camp since Gregory's party left. A road was cut several miles, in a S.S.E. direction, as straight as an arrow. I sat down at Gregory's table, and penned a notice, after placing which, and while the men were getting their dinners under a shed, I amused myself by sketching the camp from Baines's window, as it was too hot to venture out to do so. The boat's crew, having found a small pot of black paint, inscribed some amusing notices outside the doorways. On the door of Mr. Baines's hut, after I came out, I saw hanging on a board,—"Victoria Hotel. Good Beds, &c. Ginger Beer and Refreshments."

The evaporation in this river is very excessive, amounting to 13° between the wet and dry thermometers. The backs of all our books parched and curled in every shape and form. A boxwood ruler, on my table, warped 3-8ths of an inch in 24. A boxwood thermometer, 3-8ths of an inch, warped 1-10th, threatening to break the glass tube.

Coming out of the Victoria River, the 'Torch' struck on a bank, where at low-water her keel was 7 feet above the low-water line. This bank has accumulated from the strength of the tide, consequent on a rise and fall of 24 feet, since Captain Stokes's survey in 1839, when he found ½ fathom at low-water springs.

I had intended to make a few remarks during my week's visit to the Victoria River, but Captain Stokes gives so excellent a description of it, that it is unnecessary for me to do so.

Finding that the schooner had only left six weeks since for Coepang, I made all haste after her, but, on arrival there, found that she had been sent to Surabaya for docking and repairs.

At Coepang, I received a request from Mr. Baines to proceed to the Albert River, but as at the same moment Mr. Baines might be starting from Surabaya in another chartered vessel, and we should consequently be sailing side by side until anchoring off the mouth of the river, and then find that two vessels were performing one and the same service, I, the next morning, started for Surabaya, still with a hope of communicating with him. On my arrival there, however, I found that this section of the Expedition had started in a new chartered schooner on the 31st of August; and, from her being a well-found, substantial vessel, she would reach the Albert River about the end of October, long before the Expedition could suffer any privation from hunger.

The PRESIDENT returned the thanks of the Society to Lieut. Chimmo. He rejoiced that they had among them a gentleman who had come back from following the expedition, and had brought home some additional information of importance. It appeared to him that there was a lapse in the paragraph as to no other ship but the 'Torch' having been in the Gulf of Carpentaria; it could not have been the intention of Lieut. Chimmo to say so, after the voyages of Flinders and Stokes.

LIEUT. CHIMMO replied that all former vessels had only coasted the Gulf, without examining its centre.

The PRESIDENT was afraid that without this explanation, it might be supposed that the region had not been properly explored.

MR. JOHN CRAWFURD, F.R.G.S., had listened with great interest to Lieut. Chimmo's spirited account. In his opinion it was a very correct one, and one of sound judgment. In describing the country at the mouth of the Albert River as very arid, hot, and sterile, he showed it to be wholly unfit for colonisation by Europeans; and therefore, he concluded, wholly unfit for a penal settlement. This opinion, Mr. Crawfurd said, he had stated at a very early period, and he thought Lieut. Chimmo's account most perfectly confirmed it.

DR. HODGKIN, F.R.G.S., inquired of Lieut. Chimmo whether the natives at the mouth of the Albert River resembled those of Southern Australia. He had the opportunity of seeing two who were brought to England by accident by Captain Strickland, about eighteen months ago. They were tall and slender, and appeared to be friendly disposed. One of them died, and in taking the other back Captain Strickland took considerable pains that he should convey to his countrymen a friendly feeling towards the whites. It appeared that Lieut. Chimmo did not find them well disposed. Dr. Hodgkin said he was also struck with the fact of their being seen in a canoe that carried five or six people; the natives generally were so little competent to perform any work of art that the construction of a canoe of this size indicated an advance which rather surprised him.

LIEUT. CHIMMO replied, that the natives at the head of the Gulf of Carpentaria were the wildest people he ever met in his life. He was not favourably impressed with the Australian race. On a previous occasion he took nine of them from Percy Island to Sydney — the murderers of Mr. Strange, the Government geographer. He had seen canoes at Percy Island, that carried five or six persons.

The PRESIDENT said, much as the Society had been interested in the success of this expedition, and warmly as they had instigated the Government to pursue it, yet they had had no sort of control as to the conduct and progress of it. The Society was not in any way responsible, farther than for recommending certain gentlemen who had gone out as scientific members of the expedition, and who had performed their duties admirably.

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3. *Proposed Communication through North America, from Vancouver Island to Hudson Bay.* By THOMAS BANISTER, Esq.

THE routes proposed by the Americans to the southward of the 49th parallel of latitude, as contained in the 'Report of the Secretary of War on the several Pacific Railroad Explorations,' are five in number, and are enumerated in the following order, proceeding from north to south:—*First*. The extreme northern route (Major Stevens's) between the 47th and 49th parallels of latitude, and striking the Pacific at Puget Sound. *Second*. The route of the 41st parallel (Mormon route) by the South Pass, or Great Salt Lake, to San

Francisco. *Third.* Route of the 38th parallel, or Benton's. *Fourth.* Route of the 35th parallel (Rusk's) to San Pedro, on the Pacific. *Fifth.* Route of the 32nd parallel, or the extreme southern route, *viâ* Texas and New Mexico, to the Pacific. The third and fourth routes are considered next to impracticable; while the three others are attended with great difficulties and expense. Mr. Banister considers that the routes through British North America are not only the most practicable, but also, in a national point of view, the most important. He proposes starting from Fort York on Hudson Bay, and proceeding westward as far as Puget Sound, opposite Vancouver Island. The Hudson Bay Company have certain interests, but the Crown has never abandoned its sovereign rights over these territories. The Company deserves credit for its conduct, and for important things it has carried out; but the time has arrived for the Government to consider, whether the interests of the empire do not demand a reconsideration of the whole subject of the colonisation, &c., of the regions on the west coast of America from Hudson Bay.

MR. BANISTER had derived information from a gentleman who had been many years in the employ of the Hudson Bay Company, and had passed along the line, as well as from others acquainted with the country. He had been induced to make the proposition by the great demand for a passage across North America, evinced by the efforts made by the Government of the United States to find such a passage in their own territory; and he looked at the question as it affected British interests. The late proceedings in Canada, the opening of the Grand Trunk Railway, the passage into Lake Superior and Lake Michigan, the rise of Chicago, a city of yesterday, with a population of 100,000 inhabitants—all showed the rapid advance of those regions. The evidence was all in favour of the northern country becoming habitable. The travels of Sir George Simpson, Sir John Franklin, and others, were conclusive as to the richness of the country in mineral as well as agricultural produce. A gentleman, Mr. Low, had informed him that the natives on the eastward of these mountains possessed horses, and lived out in the open prairie in winter. Horses would not exist on the east coast, and that was a proof of the mildness of the climate in the interior. He was satisfied that the evidence was in favour of the necessity of the line he had proposed; and he brought it forward with the view of the Society inducing the Government first to take measures to ascertain the practicability of the country; secondly, if practicable, to decide upon establishing the line of communication; and thirdly, to devise the mode of carrying the scheme out.

The PRESIDENT was of opinion that the communication opened out very broad and important views for the consideration of geographers and statesmen. The meeting was, fortunately, attended by gentlemen who were well acquainted with these portions of North America; and with reference to the boundary line, the 49th degree, they had recently brought before them a project from Mr. Palliser, which had already been approved by the Council, for an examination of all the region from that line to the Saskatchewan, as well as the rocky and elevated region to the west of the Prairies, in order to see whether it be practicable to form a good road for British subjects without deflecting into the American territory. Mr. Palliser was in the room; and, having lived a good deal in the country, must be able to speak to the practicability of the proposed route, as well as of forming railroads. They had also present Colonel Lefroy, who was twelve years in Canada; he had enriched science by magnetic and other observations, was an admirable geographer, and well acquainted with these regions. It was seldom they had the opportunity of having a subject better discussed.

COLONEL LEFROY, F.R.G.S., said, that Mr. Banister's scheme proceeded on the assumption that whatever was not physically impossible, was commercially possible. There was certainly not a physical impossibility in the formation of this railway; but it was under conditions entirely different from those which attended the formation of railways in this country. Mr. Banister began by pointing out the analogy of Hudson Bay with the Baltic. The Baltic had its inlet on the south, Hudson Bay on the north, which made an important difference. Hudson Bay could only be entered two or three months in the year, the Baltic at all times. In ascending between Fort York and Lake Winnipeg, the traveller passed over a rugged and difficult country, of a spongy nature, 900 or 1000 feet high, until he came to Lake Winnipeg, which was itself 800 feet above the level of the sea. He had then to go through a region without inhabitants—for the whole population of this vast internal region did not amount to 100,000 souls—and then to pass over the Rocky Mountains. The general character of the country up to the Rocky Mountains was a plain, ascending gradually, intersected by extremely deep rivers. There would be some tremendous bridging required. A part of the district, which must necessarily be passed, was a mere spongy, elevated table-land, from which rivers took their source in all directions. It was not physically impossible to carry a railroad there, but it would not be commercially possible. Passing over the Rocky Mountains, the traveller arrived at Fort M'Leod, considerably on the west side of the mountains. That fort was the nearest station to the Hudson Bay Company's line on the Pacific; and such was the difficulty of communication, that the hardy traders in the employ of the Company, though they had been trying several years to establish a communication with Fort M'Leod from the west, had never, down to the period in which he visited the country, —1843-4,—succeeded in doing so. All these were reasons why he thought this railroad, which had been urged on general grounds as a great necessity, was not likely to be realised in our days.

The REV. MR. NICOLAY, F.R.G.S., agreed with what Colonel Lefroy had said with regard to the northern and western portions of the country near the sea. Although a railroad would be scarcely desirable in the direction indicated, there was no reason why, in the time of our children, if not in our own, one should not be carried across the plains to the south of the river Saskatchewan. As far as he was aware, he believed no Englishman had ever crossed those plains to the north of 49° directly to the Rocky Mountains. He hoped Mr. Palliser would be the first to do so. Supposing there should be no impediment in that direction, there would be no difficulty in crossing the Rocky Mountains. The pass indicated by Mr. Banister had been more than once traversed by the officers of the Hudson Bay Company, and he believed there were some in the room, who had traversed it themselves; it was not the best. From the account of his journey, given by Sir George Simpson, there seemed to be two distinct ranges between which the river Kutani flowed to the south. There was a pass to the south, leading into the valley between the two ranges, over which the emigrants mentioned by him crossed—whether to the south or north of 49° he was not prepared to say; but that there was an easy pass in that direction was well known. The difficulty in crossing from the northern of these passes to the Pacific, as Colonel Lefroy remarked, was no doubt very great. All this country was covered with small lakes—a network of lakes and rivers, which at certain seasons must be untraversable, and it must be centuries before it could be inhabited. But the country to the south and east of the northern branch of the Columbia was, he apprehended, of a very different character. Whether it was a country through which a railroad would be carried in our time, was another question. As to the desirableness of opening up a communication with Vancouver Island all would agree, especially as the Canadians began to feel cooped up, and wanted a way to the west. The value of Vancouver Island was becoming better known, and he anticipated great advantages, commercial and otherwise, to result from Mr. Palliser's explorations. The plains to the south of the Saskatchewan might supply Europe with corn, brought down to Hudson Bay. A home voyage once a year was quite another thing to keeping up a constant communication.

COLONEL LEFROY said with reference to the exportation of articles from the Saskatchewan, there was a considerable amount of import and export going along that line, inasmuch as all the goods brought in by the Hudson Bay Company were carried by that route, as well as the furs which they obtained in exchange. The price of the inland freight from York-Factory to the Red-River Settlement, was 18*l.* per ton, when he was in the country.

Mr. J. PALLISER, F.R.G.S., was inclined to think there was no pass known within the English territory, except the Athabasca portage, which was considerably to the north. There were two passes to the south which he believed were both in the American frontier. Even Sir George Simpson himself, who took the more northerly of the two, passed within the American frontier. Still he had heard from conversation with the hunters and trappers—Red River people—that there was a pass in the English territory; but he had only their word for it. He crossed the frontier when he was at White-earth River, the most northern part of the Missouri. But with that exception his wanderings and hunting adventures were on the American side. Still, all the nations in that part of the country might be said to belong to both English and United States territory. For instance, the Assineboins, the people he had most dealings with, wandered on both sides of the line. Also the Black Feet and the Minatorees wandered backwards and forwards, though their country was strictly speaking confined to the American side. The Indians seemed to have a very great respect for the English. Whenever he was pointed out as an Englishman, they used to pay him a sort of additional respect.

MR. BANISTER, in reply, said that early last year he had been appointed agent to parties in Vancouver Island, which brought him in connection with a great number of persons who were intimately acquainted with the interior. The natives on the coast of Queen Charlotte Islands were a very superior class of people, in proof of which he would put into the hands of the President a piece of sculpture cut from the tooth of a walrus or something of that sort. The men of these islands were almost white. They were very robust. They made fine sailors, as good as the New Zealanders. On one occasion they brought down a vessel commanded by an Englishman. With regard to a pass being found for the transit of merchandise within British territory, it was a matter of great importance, and might throw the carrying trade between California and the Atlantic States into our hands. The trade depended on the termini of the route, rather than on the country through which it passed. At all events the inquiry was well worthy of being made. A gentleman in a letter to him stated that there was a pass up the Fraser River, where the mountains fell away, that it was a very narrow passage without any obstructions, and led into the valley of the Peace River. The communication, he proposed, might not be entirely by railroad as in England, but partly by railroad and partly by other means. In order to carry out the work, he did not see why the Government should not employ criminals, and thus make them the pioneers of civilization.

MR. PALLISER thought it must depend upon astronomical observation to determine the position of the passes adjacent to the frontier. There were two passes close to one another, and the question was whether they were not both within the American frontier, or whether one might not be within the English territory. It was a very nice point to determine. As to what had been said about the natives of Vancouver Island, he thought the people of the western coast were very different from those on the eastern side, and resembling more the Polynesian race.

The PRESIDENT said they had to thank Mr. Banister for having brought the subject forward. It had given rise to an excellent discussion, that had thrown much light upon a subject of the greatest importance to every Englishman. The practicability of railroads was a subject incidental and collateral. Their first great point was to determine the physical geography of the region—therefore the projected exploration would be of considerable value, as it would set at rest whether there was a practicable route across the Rocky Mountains or not. He was glad to see Mr. Palliser, who from his acquaintance with the country, his skill as a sportsman and the good use he made of his opportunities, was capable of exploring these difficult regions—he was delighted to see him sitting next to the great explorer of Africa, Dr. Livingston. These were the gentlemen who found out the paths, by which civilization could be advanced in these distant and difficult regions. Railroads, however, must fall in afterwards. In the first instance they had to determine the geography of the Rocky Mountains, with which the world had made little or no progress since the days of Mackenzie.

Sixth Meeting, Jan. 26, 1857.

SIR RODERICK MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Robert Benson, William Benson, C. L. Gruneisen, John Costerton, and J. L. Statham, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Capt. Hartstene, of the United States Navy, recently in command of H. M. S. 'Resolute,' was elected an Honorary Member; and Dr. Alexander Armstrong,* R.N.; *Capt. John Baillie, Bengal N.I.; Capt. Thomas Blakiston,* R.A.; *the Marquis of Blandford,* M.P.; *Dr. W. F. Cumming; Dr. A. T. Chalmers; Capt. L. R. Elliot; Lieut.-Col. P. Faddy,* R.A.; *Hon. G. Fitzclarence,* R.N.; *Thomson Hankey, Esq.,* M.P.; *Capt. W. A. Pope; the Hon. Stephen E. Spring Rice; Sir Macdonald Stephenson,* C.E.; *Capt. B. J. Sulivan,* R.N., C.B.; *Col. J. Temple West; the Right Hon. J. Stuart Wortley,* M.P.; *Capt. Henry J. P. Woodhead; and C. T. Arbuthnot; Richard Blanshard; John Utlay Ellis; F. L. Evans; T. H. Farrer; Z. D. Hunt; George Lee; Edward Sullivan, and Richard H. S. Vyvyan, Esqrs., were elected Fellows.*

DONATIONS.—Among the principal donations received since the former Meeting were, several Russian maps, and the Sardinian Staff maps of the Crimea, presented by Felix Wakefield, Esq.; the Ordnance maps of all the counties of Ireland, on the scale of six inches to the mile; together with general maps of Ireland; Black's Atlas of North America, presented by the publisher; Atlases of heights, by J. M. Ziegler, Corresp. F.R.G.S.; with the Transactions of the Darmstadt Geographical Society, of the Hakluyt Society, &c.

ANNOUNCEMENTS.—The Sixth Number of the 'Proceedings,' published that day, would be distributed to the Fellows by Mr. Stanford, of 6, Charing Cross.

The Papers read were:—

1. *Extract from a Letter addressed by* TH. MACLEAR, Esq., *H. M. Astronomer at the Cape, to the Secretary.*

"Royal Observatory, Cape of Good Hope,
Nov. 3, 1856.

"The object of this letter is to report progress in the reduction of the astronomical observations, which that remarkable and excellent man Dr. Livingston, made for geographical positions, on his track from Loanda across the continent to Quilimane. He has sent them to me for reduction, and I am anxious that they should be in Sir R. Murchison's hands, according to Livingston's request, with the least possible delay: or rather, I am anxious that they should meet him in England at the right time—the time when the Society and the public at large, will be doing him due honour for services without a parallel.

1. To expedite the reductions, I had skeleton forms printed for the computation of *time from* altitudes; for altitudes *from time;* and for *Greenwich time* from the lunar distances.

2. His observed lunar distances were compared (roughly) with tabular lunar distances, in order to detect errors of date as to the day of observation—a common source of error where civil clashes with astronomical reckoning.

3. The watch-error was computed from each altitude, whether observed for watch-error or for the calculation of parallax and refraction, to detect errors of entry or of transcribing; and while this was going on, another computer was following closely, calculating the parallaxes and altitudes for the times of lunar distance measures.

The total number of altitudes computed for time is 214, exclusive of repetitions or checks.

To this point the reductions were brought up on Saturday. To-day we commence the lunar distances, which will be computed by the rigorous trigonometrical process, viz. the final computation;

for I find they must be repeated, as the assumed longitude sometimes is a degree in error; therefore at least two, but generally three, approximations will be needed.

Thus you will perceive that the only residual errors will be chargeable to the eccentricity or index-errors of the sextant, and to the errors of the lunar tables; and as Livingston unfortunately did not visit the Cape, I have had no chance or opportunity for examining the instrument.

I do hope that Livingston's merit will be acknowledged by the Crown in a substantial form. He is a poorer man than he was fourteen years back, when he landed in Africa. Without reference to higher motives, he has rendered services to science, and perhaps to commerce, such as few men have rendered. His constitution has been seriously injured by thirty-one attacks of fever. In fact, it would be difficult to find another whose claims on public gratitude are so strong."

Yours, dear Sir, truly,

T. MACLEAR.

Dr. Shaw, Secretary of the Royal Geographical Society.

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2. *Notes on the Geography of Burma, in illustration of a Map of that Country.* By Capt. YULE, of the Bengal Engineers, F.R.G.S.

IN 1855, Capt. Yule had been sent by the Government of India to Amarapura, as secretary to Major Arthur Phayre, then proceeding on a mission to that Court. In drawing up a report of the mission and of the information collected by its members, he had found a new map of the country to be much wanted in illustration of his subject, and this had led him to undertake the compilation in question.

The paper gave some account of the history of the geography of those countries, to which shape was first given by the mission of Col. Symes in 1795; and especially by the collections of Dr. Francis Buchanan, who accompanied that mission. The most important additions to our knowledge were made by the journeys and surveys of various officers, especially of Wilcox, Grant, Pemberton, Richardson, Hannay, and Macleod, between 1826 and 1837. The revolution at Ava, in the latter year, interrupted all such acquisitions for many years.

Some of the chief materials used in the new map, were, a survey of the new British province of Pegu, undertaken by Lieut. Williams, of the Bengal Engineers, and still in progress; a new survey of the province of Martaban, by Mr. Hobday; a survey of the river Irawady to Ava, by Capt. Rennie and Lieut. Heathcote of the

Indian Navy; a sketch of part of the Aracan Yoma range and its passes, by Capt. Yule; and a re-arrangement of the Chinese frontier and the Shan (or Laos) states, east of Burma, from the route-surveys of Dr. Richardson and Capt. Macleod, with additions from other sources.

A considerable error in the longitude of the Irawady at Prome and upwards, as assigned in previous maps, was pointed out. The existence of this error had first been indicated as probable by Capt. Yule, in a memoir on the Passes of the Yoma, submitted to the Government of India in 1853. The surveys since made, have confirmed this indication.

A sketch was given of the political division of the Burmese countries at four remarkable epochs, viz., circa 1500, 1580, 1824, 1854, illustrated by four comparative diagrams. In the first, these regions were shown as divided into numerous kingdoms and principalities, of which the chief were Ava, Pegu, Aracan, Toungu. In the second, Pegu was shown as predominant over nearly all. In the third, Ava had reached the climax of its power, and reigned over a territory, extending from the British district of Rungpur, on the Brahmaputra, to the great river of Cambodia eastward, and to the island of Junk-Ceylon southward, with a seaboard of 1200 miles. In the fourth, Ava was shown again contracted, and cut off from the sea in all directions, by many leagues of British territory.

After a sketch of the natural mountain-boundaries of Burma, the paper proceeded to the detailed descriptive geography of the country, from the upper course of the Irawady downwards to the sea, including the British province of Pegu and the passes of the Aracan Mountains.

An attempt was then made, from various data, to estimate the population of the Burmese empire. The general conclusion was, that the population of Burma *proper*, say from lat. 24° down to our Pegu frontier, is about 1,200,000, or less than 25 to the square mile; and that the population of the whole Burmese empire now probably does not exceed three millions. This does not differ materially from the estimate formed by the sagacity of Mr. Crawfurd, on the more imperfect data which were available to him in 1827.

An additional section of the paper gave a detailed sketch of the Shan principalities, on the eastern frontier of Burma, respecting which it is believed that no very lucid statement has yet been brought together in print. The chief authorities for this sketch were the journals of Dr. Richardson and Capt. Macleod, in the records of the Foreign department at Calcutta. These have never been published in full, as they merited to have been.

A selection of excellent photographs of Burmese buildings and scenery, by Capt. Tripe, of the Madras army, was exhibited in illustration of the paper.

The PRESIDENT said the Fellows would agree with him in thinking this a most valuable contribution. Captain Yule had brought before them a very large, graphic, and at the same time, he presumed, a very exact view of this country. Capt. Yule had examined considerable portions of the country, and had combined together and collated, as he thought, with singular ability and acumen, all the valuable documents of his precursors. He expressed in his concluding paragraph, that it was much to the credit of the Burmese, with so small a population, to have maintained their empire there, and he might add that it was much to the credit of an eminent geographer present (Mr. Crawfurd), that he should have made such a just estimate, so many years ago, as to the population of the country. No person he knew had a higher opinion of the talents displayed by Mr. Crawfurd in his work upon Ava, than Captain Yule; and it was gratifying to know that Mr. Crawfurd was present to testify to the accuracy of the statements before them. Not only had Captain Yule corrected a great number of erroneous views with respect to the longitude of different tracts, and given the general features of the physical geography of the country, but he had also given some very interesting comparative views of the condition of those vast regions at different periods of history. Captain Yule could have brought before them much more that would have been amusing. There was on the table a portrait of his Majesty the King of Burma, who received the English Mission eating "pawn," a substance which his Majesty continually put into his mouth, and chewed so continuously that it was difficult on the part of the Mission to understand what he addressed to them. There was also a view of the celebrated white elephant, which had an entire district assigned for his maintenance. Another view represented the king, with his queen smoking a cheroot in her chair of state, and the British Mission at a respectful distance. Captain Yule had called attention merely to the great geographical features of this region, and to its history, and he had done so with singular ability. He was very glad that his short absence from his post in India, where he was actively employed, had enabled him to communicate so much knowledge to the Royal Geographical Society.

MR. J. CRAWFURD, F.R.G.S.—By the favour of the President he had had the pleasure of reading Captain Yule's Report of the Mission to Burma. It seemed to be printed, but not published. Why, he really did not know, for it did great credit and great honour to everybody concerned—to the nobleman who made such an excellent selection of persons to fulfil that mission, and above all to Captain Yule, who was the principal writer of the volume, assisted by a very able geologist, Mr. Oldham. That book ought to have been published. It was public property; the public had a right to have it: and he hoped it would be published. Major Phayre and Captain Yule had gone over the ground, that he went over himself thirty years ago. They had done great justice to all the parties that went before them, to himself more than justice in most respects, although he had a few trifling comments to make upon some portions of the volume. He held in his hand a passage which, perhaps, they would permit him to read:—"Mr. Crawfurd appears to have been rendered weary, hopeless, and disgusted, by the arrogance and impracticability of the Burmese ministers, and excepting on one point—the payment of indemnity money—made deplorable concessions." Now, he was not aware that he made any concessions at all, deplorable or otherwise. In his own humble opinion he maintained a meritorious amount of obstinacy. He yielded nothing, absolutely nothing. Very great demands were made upon him. The Burmese negotiators demanded that we should restore all the territories we had taken from them in our successful war of 1826. He did not yield them a single foot: he did not give way in one point of ceremony; nor in any one essential point whatever. Captain Yule had not stated what these deplorable concessions were; therefore he was at a loss to understand what they meant. There was also a foot-note in which a strange sort of charge was made against him:—"When the king on one occasion of Burney's residence, had two of his confidential ministers dragged out and flogged with a rattan for some trifling fault, Mr. Lanciego, an old Spaniard who had been long in the Burmese service, told the resident that the Atwen-woons had only got now what they were once very near getting from Mr. Crawfurd, who in the heat of one of the conferences, started up and threatened in English to give the Burman negotiators a round dozen a-piece."* He did not mean to say that the Burmese negotiators did not deserve a round dozen a-piece, but he certainly was not the person who proposed to inflict it. He did not threaten the king's ministers with a flagellation, but they intercepted his despatches, and they brought the very individual who opened them into his presence, in the pavilion in which the negotiation was going on. He got up and told them, they ought to be ashamed of themselves, to bring that man into his presence, and he ordered him out of the pavilion, and told them that instead of exhibiting him in that shameless way, they ought to give him a round dozen. Perhaps Captain Yule would omit these passages when he published his important work. There was one point that Captain Yule did admit, that he (Mr. Crawfurd) paid some attention to the main chance. He did; he would not remit one farthing of the tribute. It was a large sum, a million sterling, a sum not to be trifled with. There were many matters contained in the volume, upon which he could make some observations. The Burmese country very much resembled a great section of America when first discovered—a very remarkable circumstance. There were numerous tribes that had come under the notice of Captain Yule, who were in various social conditions, and speaking distinct languages. All these languages were monosyllabic; every one of them consisted of a single syllable: the people had never been able to put two syllables together, except some foreign words which they had acquired Our own "fee, faw, fum," was a joke to what they put forth as speech. With respect to the Mission having a permanent location at the Burmese court, Lord Dalhousie had the good sense not to send one. He had been appointed to reside there, and he had seen the impolicy of it. The Indian government persevered for ten long years, and Captain Yule knew what had been the result. Colonel Burney went, but he was absolutely driven out. A successor, Colonel Benson, followed. The Burmese kept him on a sand-bank four months. The Indian government then gave it up, and no embassy was sent afterwards. He would make the same representation to her Majesty's government, and also to the government of the French emperor, who he was told was about to send an embassy to Pekin. It would never be established except by the force of cannon; and when established it would be found useless, and the envoy would be made as miserable as possible.

CAPTAIN SHERARD OSBORN, F.R.G.S.—He observed there was a river eastward of the Irawady, which appeared in the charts to be connected with the frontiers of China. Was Captain Yule in any way acquainted with the source of that river?

CAPTAIN YULE.—That river is the Salween. No one knew the source of it. As shown in d'Anville's maps, it came from the north of Thibet. He did not believe that it came from that extreme distance. No one, however, had ascended above the British frontier, and no one knew anything about it, except that it was rocky, and navigable only for small canoes.

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* See Yule's Narrative of Major Phayre's Mission to Ava, p. 233.

The PRESIDENT called attention to the geological portion of the work, as communicated by Mr. Oldham, the superintendent of the Geological Survey of our dominions in India. He was associated with Captain Yule in surveying the country, and the concluding part of the volume contained a great deal of important information with respect to the structure of the country, the rocks, and all their relations. The work was rendered additionally valuable from its observations on the statistics of the productions of the country, including the mineral productions with the observations of Mr. Oldham.

MR. CRAWFURD.—He ought, in justice to the nobleman who obtained this annexation of Aracan and Pegu, to mention an important fact respecting them. It was well known that Bengal—rice-producing Bengal—was a densely peopled country. The consequence was that the price of rice had been constantly rising. Aracan and Pegu were countries of a totally different description. They were unpeopled. Captain Yule did not estimate the population at above 25 inhabitants to the mile, whereas there were some portions of Bengal which contained 600 to the square mile. There was a great abundance of fertile land in the valley of Aracan. The price of corn and rice was regulated by the quantity of land of the first quality, capable of producing it. All the land at present in use in Aracan for the production of rice, was of the first quality. The result was that the export of rice from Aracan alone, though a country of but 10,000 miles in extent, was greater than the exports from all Bengal together. In former times the settlements to the eastward—Penang, Singapore, and all the countries in that direction—used to be supplied by Java. The policy of the Dutch, by displacing rice and encouraging other productions less profitable to the people, had been such as to enhance the price of rice to such an extent that these districts were now supplied from Aracan. A very large amount of the rice of Aracan was also exported to Europe, to the value of one million sterling annually, as he had been informed by a merchant connected with the trade. These facts showed that our Burmese possessions were likely to become important countries.

3. *Journey across the Kuen-luen from Ladák to Khotan.* By the Brothers SCHLAGINTWEIT.

Communicated by Col. W. H. SYKES, V.P.R.G.S., etc.

PROCEEDING from Ladák, through Nubra, to the Pass of Karakorum, we were able to pass the frontier of Ladák, and to extend our observations over very nearly the whole breadth of the Kuen-luen Mountains. We estimate (not yet having reduced our astronomical observations of latitudes and longitudes) the distance we travelled in Turkistan, before returning again into Ladák, to be very nearly 300 English miles.

We left Ladák July 24th, 1856, went by Laoche Pass (17,600 feet [*]) to the valley of the Shayuk and Nubra; from Nubra we crossed the Sassar Pass, about 17,500 feet. We stayed two days on the Pass itself to make magnetic observations and to enable us to reach the summit of the Sassar La—20,000 feet—from which we had, as we anticipated, a very extensive and interesting view of the large groups of glaciers surrounding the Pass, one of the largest accumulations of glaciers in the Kuen-luen.

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[*] All the heights in this Report are only approximately correct. Very good corresponding observations were taken at Ladák, but we have not yet found time to make the necessary calculations.

From the Sassar Pass, our route brought us to the large plateau to the south of Karakorum, the mean elevation of which reaches 17,000 feet. On the 9th August we crossed, without any difficulty, the frontier of Turkistan.*

We were accompanied by Mani, the Putwarce of Nilum; by Marshoot, a former servant of Moorcroft; and by Mahomed Amir, an aged Turkistani, whom we found particularly useful on account of his general knowledge of the country.

We had besides, six horses for ourselves and servants, thirteen for baggage, five Yarkandis, and some fifteen sheep and goats.

The Yarkandis, with horses and provisions, we sent on, and we only met them by chance at Nubra.

Our servants from the plain, accompanied us as far as Sassar, from whence we travelled dressed as Yarkandis.

The day before we passed the Karakorum, at 18,300 feet, we met a large caravan of merchants from Yarkand, to whom we gave out that we intended to march on the Yarkand road, but, as soon as we had passed Karakorum, we left this road and went to the east of Kizilkorum, 17,400 feet, the high-water parting between Yarkand and the Karakash river. In one day we crossed four passes, exceeding 17,000 feet above the sea, but only slightly elevated above the surrounding plateaus.

From Kizilkorum, we followed the direction of the principal chain of the Kuen-luen, now turning to the south-south-east, till we reached a lake, Kiuk-kiul, slightly salt, situated at the northern foot of the Chanchcumo.

Up to this point, our route had chiefly led us over extensive plateaus 16,000 to 17,000 feet above the level of the sea, of a much greater extent than those to the south of Karakorum; but from the lake we followed the valley of the Karakash river, to the right of which there are no plateaus, while to the left they extend as far as Suget.

The sterility of the plateaus to the north of Karakorum, as well as of the Karakash Valley, is quite surprising; and without the frequent, though not very abundant showers, chiefly caused by the great elevation of the ridges, these plateaus would be complete deserts.

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* *See* Journal of the Asiatic Society of Bengal, No. IV., 1856, p. 344, for Travels in 1852 from Cashmere through Yarkand, Kokan, Bokhara, and Cabul, in search of Mr. Wyburd.—ED.

In a march of 18 miles, we only met with four species of plants; for many days grass was exceedingly scarce, while for several days we had absolutely none, the grass round the Kiuk-kiul Lake being the only exception. We had taken comparatively a small supply of grain, anticipating in some degree the sterility we met with, which saved our horses from absolute starvation; nevertheless they suffered dreadfully, the more so as the scarcity of grass compelled us to make long marches of 20 to 24 miles a day. Close to the Kiuk-kiul we met with a very interesting group of more than fifty hot springs, chiefly containing muriate of soda and a great quantity of carbonic acid; their temperature varied from 77° to 120° Fahr.

We had already met, in the Valley of the Nubra, with two other groups: the one near Panimik (hottest spring), 78·1° (=172·6 F.), the other near Changlung, 74·1° (=165·4 F.).

After a march of 70 miles in four days, we came to Pumgal, where a route branches off by the Valley of Bushia to Elchi, the capital of Khotan.

From Pumgal a road branches off, as mentioned above, to Bushia and Elchi; and as there was some hope of procuring at these places fresh horses or yâks, as well as food, our men were easily persuaded to proceed towards them. We started August the 22nd, with only two laden horses, and had to cross a glacier pass of 17,000 feet, where, at 10 A.M., we were overtaken by a violent snow-storm, lasting till 6 P.M. The road was extremely difficult for the horses, on account of the number of fissures in the glaciers.

In Bushia, which we reached two days later, on the 25th August, we met with a very cordial reception from the inhabitants, and got horses, yâks, sheep, and provisions, on the promise of payment in Pumgal.

These people—half-nomadic Tartars—appeared very honest, and the prices they asked were certainly moderate. They inhabit caves, fitted up like houses in the cold season, and tents during the rest of the year. The height of Bushia is 9200 feet. We had taken the precaution of dressing ourselves like the inhabitants, and had also learned the necessary forms of salutation, for the people here are far from being savages, but are, on the contrary, very ceremonious. They took us—never having seen any Europeans—for what we represented ourselves to be—merchants from Delhi. Elchi, the capital of Khotan, was only two days' journey distant, but we found the people very reluctant to accompany us thither (for they feared the Chinese soldiery stationed not far from Bushia); besides the time was far advanced for our intended tour in Cashmir. The distance from the northern foot of the Kuen-luen was one and a half day's journey. Already at Bushia the Alpine character of the central Kuen-luen had disappeared, the height in the environs of Bushia not exceeding 11,000 feet. We left Pumgal on August 29th, and followed, for three marches, the valley of the Karakash river, which flows from Pumgal to Suget in a westerly direction, then takes a sharp turn to the north, and then flows for the most part in an east-north-easterly direction. We met on this road with very large quarries and mines, from which is dug the Yashen stone, and which are resorted to by people living at great distances. We were enabled to procure, for future analysis, a good supply of this stone, which is very much valued throughout Central Asia.

Suget, a halting-place on the winter-road to Yarkand, is six ordinary marches distant from Karakorum; from Suget to Karakash, another town of Khotan, is six marches.

After due deliberation, we started, on the 1st of September, with Mohamed Amir and only two laden horses, leaving everything we could do without, including our little tent.

Some instruments, blankets, furs, and provisions were all our baggage.

We succeeded in making in twelve days about 220 English miles across the central parts of the Kuen-luen (25 marches of the Russian itinerary route from Yarkand to Leh). We reached Leh in the evening of the 12th of September. The country between Suget and the Karakash Pass was new to us; we had here a very good opportunity of examining the plateaus above mentioned and determining the mean elevation. We had also, before we reached the Pass, a very extensive view of the highest central peaks, which we tried to draw on the scale of 1 degree to 1 centimetre.

From this point we wished to follow the Shayuk river, as the route would have taken us through country new to us. We also met, amongst many others, a caravan with fourteen dromedaries, not unfrequently used for carrying loads on the Yarkand road; they are the produce of a singular cross between yâks and kiangs (*sic*), and inhabit heights of 16,000 to 18,000 feet. We succeeded in getting two of them (remarkably docile animals), expecting to find them particularly useful in crossing the frequent rapids in the Shayuk river, as well as the glaciers and rocks so common in these parts. But, notwithstanding the height and power of these animals, we found it impossible to go down the Shayuk valley. The river had much subsided, compared with its height when we crossed in the beginning of August, but it was still far from passable, as it is from the end of October to the end of March.

We were obliged, therefore, to leave the road down the Shayuk valley at Sultan-Chushun, and go up the valley to Sassar, and from thence follow our old route. We had to cross the Shayuk river, not without difficulty, five times in one day before we reached Sassar. During our absence from Leh, our native doctor Shirkishin had made meteorological observations, and—what was especially valuable to us—detailed barometric and magnetic observations; had completed a plan of Leh, 11,000 feet, the chief points of which had been laid down before our departure; and had sent collectors to different parts of Ladák to complete botanical and geographical distributions. We found all our orders had been carefully executed.

Our horses and luggage left behind at Suget, not arriving for thirteen days after us, Sept. 25th, we had time, besides finishing our plans and drawings, to make numerous casts in plaster of Paris * of individuals of different tribes, as we had already done in different parts of India and the Himálayas.

The PRESIDENT expressed the thanks of the Society to Colonel Sykes. The brothers Schlagintweit were well known to geographers and naturalists for having distinguished themselves in the survey of the Alps, and in various communications published in Germany. Baron Humboldt had always had the highest estimation of their capacity and talents. They were now employed in surveying, under the patronage of the East India Company, those distant regions into which few travellers had been. The paper contained evidence of talent, and he had no doubt there were some valuable observations with respect to the mineral springs of the country, an important point in the geographical feature of that region. It was a point to which Baron Humboldt called attention that the Kuen-luen was of volcanic origin, of which these hot-springs were the only active remains.

Mr. W. J. HAMILTON, F.R.G.S.—Although he had no knowledge of the country itself, he could not resist rising to express the satisfaction with which he had listened to the communication. He had the pleasure of knowing these distinguished German brothers previous to their departure from this country, and it was with the greatest satisfaction he had listened to the statement of the progress they were making in the investigation of the physical features of this interesting district. From the opportunity which he and many members of the Geological Society had of appreciating the talents, energy, and zeal of these travellers, he was sure they might look forward to receiving much valuable and interesting information from them. The extracts which had been read contained but a small portion of the information which they had sent home. When the whole paper was published, he had no doubt it would be found to enter into many interesting details on other points.

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* We were obliged to H. Longden, Esq., superintendent of the 'Secundra Press' at Agra, for a very precious supply of plaster of Paris when our own stock was nearly exhausted.

4. *On Trinidad and the Orinoco.* By Lieut.-Col. J. SMYTH O'CONNOR, F.R.G.S., Governor of the Gambia.

AFTER a brief sketch of the history of Trinidad, alluding to its discovery by Columbus, to its conquest by an English force under Abercrombie in 1798, and to the most distinguished of its subsequent Governors, the natural features, products, and resources of the island were described. The commanding situation of Trinidad, with reference to the navigation of the great river Orinoco, and the productive character of the countries on the banks of that stream, rendered it remarkable that no efforts had been made to establish steam-communication through that important channel between Trinidad and the interior of the South American continent. Horses, cattle, wheat, and produce of all kinds and of the finest quality, can be raised on its banks; while its navigable waters offer great facilities for disposing of English manufactures in the interior, reaching westward nearly to the capital city of Bogotá, and southwards within a short distance of the navigable Rio Negro, a branch of the Amazon.

In conclusion, the proposal of Admiral Elliot to explore the Orinoco, to ascertain the extent of its navigable waters and the means of connecting them with the navigation of the Amazon, was strongly urged by the author, as a matter of great importance to English commerce, particularly in connection with Trinidad.

The PRESIDENT thanked Colonel O'Connor for his communication respecting the advantages to be derived from a farther exploration of the Orinoco, with reference to the very fine colony which he had described in such a graphic manner. Colonel O'Connor had followed up the proposition of Admiral Elliot, and he was sure if the recommendation of the Geographical Society was communicated to her Majesty's Government, that something would accrue to the advantage of science, and he should hope to the eventual interests of the country. He had hoped also to have received a communication from Baron Humboldt, to whom he wrote about ten days ago, explaining that the Society had had one communication, and were about to have another, on the importance of opening up the navigation of the Orinoco. Perhaps the communication would come on a later day, and that he should be able to read it at a subsequent meeting. The Government had decided to make a mineral survey of the West India isles. As Superintendent of the Geological Survey of England, he had been directed by Her Majesty's Government to appoint two gentlemen to make this survey. Trinidad would be the first, and he trusted the result would show the importance and value of that colony.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1857.

Seventh Meeting, February 9th, 1857.

Sir RODERICK I. MURCHISON, President, in the Chair.

Presentations.—*Captain John Baillie, Bengal* N.I., *was officially introduced upon his election.*

Elections.—*Lieutenant Wm. Chimmo,* R.N.; *Dr. Robert Dobie,* R.N.; *Henry S. Keating, Esq.,* Q.C., M.P.; *Capt. Henry Yule, Bengal Engineers; and J. M. Airey; J. B. Brasted; Dalton F. G. Dalton; John Gilchrist, and John Stuart Glennie, Esqrs., were elected Fellows.*

Donations.—Among the donations to the Library and Map-Rooms since the former meeting were—'Minutes of the Committee of Council on Education, Downing-street;' 'Werne's Expedition to Discover the Sources of the White Nile,' presented by Mr. A. S. Twyford; 'Memoir on the Euphrates Valley Route to India,' by Mr. W. P. Andrew, F.R.G.S.; 'Report on the proposed Railway between the Danube and the Black Sea,' presented by Mr. Lewis Gordon; 'Annales de l'Observatoire Physique Central de Russie,' presented by the Minister of Finance, St. Petersburg; 'The Atlantic Neptune, for the use of the Royal Navy,' presented by Mr. W. B. Webster.

Exhibition.—The President called the attention of the Fellows to a marble bust of his eminent friend and associate the late George Bellas Greenough, Esq., former President of the Society, executed by Mr. Burnard, as ordered by the Council.

The Papers read were:—

1. *Notes on the Route from Bushir to Shiraz.* By Lt.-General W. Monteith, F.R.G.S., etc.

[As this Memoir will be published in the Journal, the following is merely a brief allusion to some parts of it.]

General Monteith thought the Passes between the two places to be less formidable than generally believed. He had repeatedly traversed and examined them. No doubt there were many and serious difficulties to be met with in the shape of deficiency in quantity, and indifference in quality, of the water in many places, the difficulty in crossing the ravines, and such-like obstacles; but he thought that in neither of the two great Passes were there insurmountable obstacles to conveying an army through them. There were a number of tribes in the various districts along these Passes; but he believed upon the whole they were rather friendly inclined than otherwise. The great force of the province of Fars consisted of the ancient Persian tribes, the assembling of whom by the Government would be attended with considerable danger, as it would be uncertain which side they would take.

The PRESIDENT, in returning thanks to General Monteith for his communication, reminded the Society that General Monteith was one of their earliest Associates. He might tell them that in the year 1831, almost immediately after the establishment of the Society, General Monteith produced before them a map, which had been subsequently published, relating to the north-western districts of Persia, and particularly to the Caucasus and Armenia. As this distinguished officer accompanied Sir John Malcolm in 1810, and was nearly twenty years in the country, and as he had been an eye-witness of all that he related, he (the President) need not say that his account was to be relied on. His recent work on Erivan and Kars was well known. He had been with both the Persian and Russian armies in the campaign of 1824; and also with Prince Paskievitch in the Erivan campaign. He, the President, was happy to observe among the Fellows present so able a commentator on Persia, as Sir Henry Rawlinson,—one who was so capable of giving a lucid explanation of the geographical features of Southern Persia, and who he hoped would be induced to extend his observations also to other parts of those regions, and to diversify the subject by allusions to the great historical events of antiquity.

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2. *Observations on the Geography of Southern Persia, with reference to the pending Military Operations.* By Col. Sir HENRY C. RAWLINSON, K.C.B., F.R.G.S., etc.

SIR H. RAWLINSON.—Before proceeding to offer any observations on the geography of Southern Persia, I think it proper to explain that I wish these observations to be understood as applying to a purely scientific and geographical subject. This is not the place nor the occasion, to enter into any political disquisition. I beg it to be understood, that in describing the geography of the country, in which the now pending military operations are being carried on, I offer no opinion as to the justice or the expediency of the Persian war. As a geographer, I am content to take the commencement of that war as a "fait accompli;" and I hope soon to be able to include the termination of it in the same category. The expedition, as you are aware, on leaving Bombay, proceeded first to the Persian Gulf. This Gulf in olden times was called the Erythræan Sea. I shall not fatigue you by going into the details of the ancient history of the country; but I may just mention that this name of Erythræan Sea recalls many associations of great interest. The Red Sea of Egypt and the Persian Gulf were both called the Erythræan Sea, or Red Sea, not in allusion to the colour of the water, as has been sometimes supposed, but rather as "the sea of the Red Men;" for those Erythræans, or "Red Men," who inhabited equally the shores of Abyssinia and of the Persian Gulf, were a great Hammite race—the same which founded the kingdom of Nimrod in Babylonia, and to which belonged the Æthiopians of both Africa and Asia. These people, wherever they were found, were called "Red Men," having thus the name of *Erythræans* in the Persian and Arabian Gulfs, of Phœnicians on the shores of the Mediterranean, of Idumeans in the valley of the Euphrates, and of Homerites in the south of the Peninsula; for all these names have the same signification of "Red;" and thus the tradition is explained, that Phœnicia was colonised by the Erythræans: they are, in fact, the same people. We have indeed many proofs of this identity, which I shall be able perhaps to notice as I proceed to explain the actual geography of this famous sea. Probably the first point which will interest you, is a notice of the scenes of the recent expedition from Bombay. I have here a small plan—an amplification of a chart of Bushir and the surrounding country—for which I am indebted to Colonel Sykes. This chart shows you the country where the troops landed, and through which they marched from Hallila Bay to Bushir. The most interesting and curious matter connected with the march is this, that the very point where the British troops first came into collision with the Persians—a place which will ever be remembered as the scene of a great victory of our troops, and where so many gallant officers fell—that spot happens to be the most important in point of antiquarian and historical interest of any place in the whole Persian Gulf. At this very spot indeed existed in antiquity, the great capital of the race which ruled in the Erythræan Sea. The remains of a city are still to be seen there; and from its ruins I produce here an actual fragment, a brick from the Temple of Tirhakeh, the great king of Æthiopia, who was contemporary with Sennacherib. There are many specimens of the same class in the British Museum; and this particular brick was sent to Col. Sykes. I have written a few notes upon this place, Rishir, which probably you will allow me to read:—

"In remote antiquity it must have been a place of much importance, for numbers of bricks, impressed with cuneiform legends, have been dug up in the immediate vicinity, belonging to the Cushite or Æthiopian race, who also held the neighbouring province of Khuzistan, and whose bricks are commonly found at Susa. Upon these bricks are found the legends of *Sutur Nakhunta*, contemporary with Sargon of Assyria, and *Kudur Nakhunta* and *Tirhakeh*, contemporary with Sennacherib. There are so many points of connexion at this period between the Æthiopians of Africa and the Æthiopians of Asia, that is, between Meroe and Susa (such as the identity of the traditions referring to the two countries, the double Memnon, double Cepheus, &c.), that I think it by no means impossible the Tirhakeh of the Erythræan Sea, whose bricks are found at Rishir and Susa, may be the very king of that name, who is mentioned in the Bible and in the cuneiform annals of Sennacherib, as having invaded Syria from Egypt, and having fought with Sennacherib, while that monarch was engaged in his famous campaign against Hezekiah of Judæa. At any rate, the kings had the same names; they belong to the same period of history, and ruled over divisions of the same race. And if the geographical distance of Meroe from Susa and Rishir be thought to be fatal to the identification of the two Tirhakehs, I would quote the nearly parallel case of the Imaum of Muscat, who at the present day holds Kishm in the Persian Gulf, and Zanzibar on the coast of Africa.

"Under the Achæmenians we are unable to ascertain the name of Rishir. The metropolitan city of this period, in the vicinity, was Taoke, or Dalakee, where there was a royal palace of the Persian kings, mentioned by Strabo, Arrian, and Ptolemy; and the port of this city was at the mouth of the Granis, either at Bunder-Rig, or at what is now called Rohilla Point, extensive ruins being found at both of these spots at the present day. (*Yacut* notices these ruins south of Genava, and applies to them the name of Shiniz, which, however, generally denotes a place at the mouth of the Tab.)

"Under the Sassanians, in about A.D. 230, Ardeshir Babegan rebuilt the two cities of Taoke, or Toug, and Rishir, and called the one 'Ram Ardeshir' and the other 'Riv Ardeshir'—that is, 'the rest of Ardeshir,' and 'the delight of Ardeshir.' Riv Ardeshir became corrupted into Rishir, which has applied to the ruins of the city ever since.

"During the third and fourth centuries, Riv Ardeshir was the seat of the Christian metropolitan of Persia; and Johannes of Rishir, who sat at the Nicene Council in 325, is said to have had ecclesiastical jurisdiction over all the churches both of Persia and of India.

"At the time of the Prophet, Shahrek, the Marzaban or 'Lord of the Marches,' a Magian chief, held all this part of the country; and the Arab historians describe his conquest by El Hakam el Thakafi, who was sent by Omar from Bahrein, to reduce the sea coast of Persia. The two battles, by which Shahrek lost Toug and Rishir, are described in detail; and the latter engagement is said to have been not less bloody than the famous field of Kadissieh."

Now, that is the history of Rishir in antiquity—of a ruin which has passed almost unnoticed up to the present day, and has only been called into prominence by the recent operations. I have given you a brief, though continued history of it from the time of Tirhakeh, the great Æthiopian King, down to the Mahommedan conquest. After that period, the place fell into ruin, and it is rarely mentioned by geographers, until about the year 1500. In 1520, I believe, it was repaired and rebuilt by the Portuguese. The fort which the enemy occupied on the recent occasion, and which is called the Portuguese fort by us, is, I believe, one of the very old works. It is called in the country, generally, "the Fort of Nebuchadnezzar," and it is always noticed in the Persian gazettes as the "Fort of Bahmen," who was a King of the old Dynasty.* The Portuguese restored this fort, but the name they gave to it, I have never been able to discover; it was probably, however, a real Portuguese name; at the present day it has recovered its old name of *Rishir* (or *Riv Ardeshir*), and perhaps dates from the time of Tirhakeh, the Æthiopian King.

I must now return to the more important subject of the actual geography of the gulf. From the earliest times, the Persian Gulf has been of much consequence, owing to its position upon the great line of communication between the east and west; that is between India and Europe. There have thus been in the Persian Gulf, a succession of *emporia*, places where the commerce of the gulf was concentrated, and which varied in situation according to circumstances. The earliest port, as far as I have been able to discover, was situated at the mouth of the Euphrates. That was probably anterior to the Persian Empire, before, I mean, the Empire of Cyrus the Great. When the empire of Cyrus was instituted, and Persepolis became a great capital, then the city at the mouth of the river

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* By the name of Bahmen the Persians indicate *Bahmen Ardeshir*, or Artaxerxes Longimanus; but it is probable that in adopting this nomenclature they have confounded the two Ardeshirs, referring the tradition of *Ardeshir Babegan*, who really rebuilt *Rishir* in about A.D. 240, and named it *Riv-Ardeshir*, to the more ancient Bahmen Ardeshir or Artaxerxes Longimanus, who lived in the fifth century B.C. An instance of the very same confusion occurs in the vicinity of Mohamrah, where the city known to the Greeks as Χαραξ Σπασίνου, and rebuilt by *Ardeshir Babegan*, who gave it the name of Asterabad, or *Kerkh-i-Misán*, received after the Arab conquest, the title of *Bahmen Ardeshir*, now corrupted to *Bahmishir*.

Granis soon rose into importance, as the port from which all the supplies of merchandise came into the country.* At the time of Alexander's eastern campaign, we find mention made of Mesambria, which is probably Bushir, and of the river Rhogonis, which is the same as the Genava.† There were emporia probably at both of these spots. In later times, the time of the Mahommedan conquest, the great place was Siráf. This place, Siráf, continued to be the emporium of the Gulf for a long period,—indeed, probably four or five hundred years,—but the site has been improperly laid down in the maps.‡ Then, the emporium was moved to the island of *Keis* or *Kenn*. After Keis was ruined, the great emporium was at Ormuz on the main land; and when that was destroyed, it was removed to the island of Ormuz. This place, the island Ormuz, was taken possession of by the Portuguese in 1519, and for above 100 years it was the entrepôt of all the commerce between the east and west.§ In 1625, the East India Company sent three officers, Captains Bligh, Weddell, and Monoxe, with a considerable fleet to assist Shah Abbas in driving out the Portuguese. It was during this expedition that the famous navigator Baffin, the discoverer of Baffin Bay, was killed at the bombardment or siege of a place on the neighbouring island, the town of Kishm, from which the island has its modern name.* The Portuguese after a short siege were obliged to capitulate, and Ormuz was taken possession of by the united British and Persian force. In consequence of this exploit, Shah Abbas gave privileges to the British government which we retain to the present day; in fact, it is owing to the assistance rendered by us in the taking of Ormuz, that we have the right of possessing a residency at Bushir. Shah Abbas, in the first instance, permitted us to have a factory at Gombrun, or Bunder Abbas, opposite Ormuz; and this remained until about 100 years ago, when the establishment was transferred from Gombrun to Bushir, and early in the present century, the Factory was exchanged for a Residency. It is quite impossible to give now a detailed description of every place along the coast from Ormuz up to Bushir. All I can do is to explain generally that the sea-board of the Persian Gulf consists of a belt of low land, with mountains at a short distance from the coast, varying from ten to thirty miles, seldom more than thirty, and seldom less than ten. At Bushir, the distance is about twenty-five miles. This low land between the mountains and the sea is arid, badly-watered, containing no trees, except date-trees, and inhabited by Arabs. It is altogether a very unpromising country. The hills ascend abruptly at about thirty miles inland, and are intersected by numerous valleys watered by mountain streams. These valleys are beautiful spots, filled with lovely gardens, and inhabited by fine mountain tribes, who are probably the best class of men among the whole Persian nation, whether considered in regard to bravery, honour, or fidelity. At the northern extremity of the Persian Gulf, the mountains recede more to the northward, leaving a large tract of country which is entirely plain, and which was formed originally by the alluvial deposit of the large rivers that here descend from the mountains. This tract of country is extraordinarily rich, and quite different in character from the belt of low land in the neighbourhood of Bushir. It is an alluvial soil, admirably adapted to cultivation, while the other tract is a mere barren, sandy desert. If it should be necessary—which of course we all hope it will not be—to continue operations in the Persian Gulf, it is only natural to suppose that we shall turn our attention to the particular part of the country I am now noticing; and I may as well, therefore, explain to you something of its geography, commencing with the mouths of the river Euphrates and the surrounding delta. You are aware no doubt that, according to the intelligence we have in the public papers, there is another division about leaving India at the present time, and I am thus betraying no confidence in alluding to the probability that this division may be directed to disembark at Mohamrah, which is the only other Persian port of any consequence on the gulf. If I may judge from the admission of an influential journal, of its ignorance of the position of Herat, the English public would seem to be not very well up in geography, notwithstanding the efforts of this Society to spread a knowledge of that interesting science. It can hardly be questioned, however, that we are improving. A few years ago we had very little acquaintance with Balaklava, or Kertch, or any of the Ports, either in the Sea of Azof or on the coasts of the Black Sea. Now, they are all household words. In the same way we know very little at present about Bushir, or the place to which I am about to introduce you, Mohamrah, but it is very possible that before long they will also become household words with us. I must commence then by explaining that Mohamrah is Persian soil. Upon this map, the frontier between Persia and Turkey is not laid down at all; and in most of the maps where the frontier is laid down, it is done incorrectly. The real line of frontier between the empires, not only as it exists at present, but as it is confirmed by the treaty concluded at Erzeroom under the sanction of England and Russia, comes down to Mohamrah, and then follows the course of the river Euphrates to the sea, so that this island named *Abadán** is Persian. I should here perhaps repeat the statement which I made to this Society on a previous occasion, much to the surprise of the President, that all this country is quite new, within comparatively recent times. We can indeed historically trace its formation mile by mile. The great city of which the ruins are to be seen above Mohamrah was an island in the time of Sennacherib, named *Billat*.* It was an island even up to the time of Alexander, being mentioned in the history of that period under the names of Aphle and Apollogos. As Obollah on the sea coast, it became the great entrepôt, under the Sassanians and the early Arabs, of the commerce running up the Euphrates. Now, it is sixty miles from the embouchure of the river, and we can trace a succession of cities below it, along the river, down to the sea. It would seem indeed, that every two or three hundred years, a new city was founded on the sea shore, that it was then left dry, and the people were obliged to desert it and form another port lower down. In continuation of this subject, I may mention that along the whole of the sea coast, from the mouth of the Euphrates to the mouth of the Tab, there is a series of extensive sandbanks, which will all become dry land in the course of a few years. The reason of this change is again quite evident. It is not merely the simple physical process that we observe in other countries, namely, that the river water coming down charged with alluvium, and meeting the tide, deposits the matter that it holds in solution; but there is in the Persian Gulf an additional cause of deposit. There are indeed but two winds, either the north-west blowing down the valley of the Euphrates, or a strong south-easter blowing up in the face of it. When the wind blows down, there is of course no deposit; but when it blows up, which it often does for days together and with great violence, it then brings the whole force of the sea directly against the current of the Euphrates, and an enormous deposit naturally takes place. That deposit is going on yearly; and, undoubtedly, in a few hundred years, the mouth of the river will have extended out very much farther than at present. According to my calculation, the increase is about a mile in thirty-five, or in less than forty years. It is very doubtful if, what is now called the mouth of the Euphrates, be the true mouth of the river. The true mouth of the Euphrates, I myself believe to be, what is now called, the *Bahmishir*, and that which is at present, the mouth of the

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* The name of the city at the mouth of the Granis is not given by Arrian; but Ταόκη is mentioned some way up the stream, as the site of one of the royal palaces; and both Strabo and Ptolemy confirm this statement. Now Taoke is of course the *Toug* or *Touj* (توگ or توج) of the Arabic geographers, immediately at the foot of the mountains on the road from Shiraz to Genava; thus exactly answering to the position of the modern *Dálaki*, and leading to the inevitable inference, that the mound on which the present fort is built, covers the ruins of the old Achæmenian palace. The Dálaki river, or Granis, formed of two arms, which unite before it leaves the mountains, again bifurcates as it approaches the sea, one arm falling in at *Rohilla Point*, and the other at *Bunder-Rig*. There are extensive ruins at both of these places, probably of the Æthiopian period; but it is at Bunder-Rig, I think, that we must look for the *Shiniz* of *Yacut*, a very ancient site south of *Genava*.

† *Aru-guna* (*i. e.* Ῥώγωνις) in Hamite Chaldee, and *Gunáva* in old Persian, signify the same thing, "the river of *Guna*." The Arab geographers usually write the name جنابه *Jenábeh*; but the old pronunciation of *Gonava* is now alone known in the country. It is just opposite to the island of *Kharg*, or Karrack.

‡ The error of placing Siráf to the south, near Cape Sertes, originated with Sir W. Ouseley, who confounded the name with that of *Shinás*. The real *Siráf* is now called *Shilau* (an older form of the same name, probably meaning "a torrent" or "full stream") and is close to *Taurie* (properly *Táhiri*, from its founder *Táhir*), and not many miles from Congoon. Morier describes the antiquities of the place, and its cuneiform bricks, on the authority of a naval officer who had visited the ruins. It should be well examined during the present expedition.

§ The 'Ορμοῦσια of Arrian is Ormuz, on the mainland. The island he calls 'Οργάνα, which is probably the same as *Gerún*, altered by the Arabs to *Jerún* (جرون).

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* Arrian names this island, which was said to contain the tomb of the Eponymous hero, King Erythras, Οαρακτα; and the title remains to the present day, under the scarcely altered form of *Vroct*. The name is, I suspect, Hamite Chaldee, signifying "the separated," or "broken off," in allusion to the natural convulsion which divided the island from the main in remote antiquity, and the tradition of which has been preserved by Justin (from Trogus Pompeius) in his description of the migration of the Erythræans from the Persian Gulf to colonize Phœnicia. The Arabs named the island *Laft*, from a town of that name which still exists at the back of the island, and *Ibn Gáwan*, بن غاون, from the tribe which settled there.

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* The island of *Abadán*, lying between the *Bahmishir* (properly *Bahmen Ardeshir*) and the *Shat-el-Arab*, or the two streams which form the delta of the Euphrates, answers to the Southern Mesene of the Greeks, and the *Misán* of the Arabs and Talmudists. The name in the inscriptions of Sennacherib, which has been read *Khupapan*, ought, I think, to be pronounced *Hubadan*, the same as the *'Abadan* عبادان of the Arabs, and 'Αφφαδάνη of the Greeks. The early Persians named the island *Miyan Rudan*, "between the rivers," evidently after the Greek Μισήνης, from which term also the Oriental *Misán* was probably derived; for the title is unknown in the ancient inscriptions, and has no meaning in the Semitic tongues.

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* The ruins of Obollah, which was a place of great importance at the time of the Arab conquest, and which may very well be supposed to represent not only the *Billat* (the *t* is the mere feminine termination, and was probably dropped in pronunciation) of the cuneiform inscriptions, but the Aphle and Apollogos also of the Greeks, are to be seen on the right bank of the Euphrates, about two miles above the mouth of what our sailors call the Haffar or Mohamrah Creek. The name, however, of Obollah is now lost. The site is of much interest to Indians, as the place whence the Chaldeo-Persian colony emigrated on the approach of the Arabs under *Khaled*, and sailed for India, carrying with them books, like the Bundehesh, written in a language that we call Pehlevi, but which is in reality the vernacular dialect of Southern Chaldæa in the seventh century. The colony landed at *Sindan*, in Guzerat, now called St. John; and the Parsees of Western India are their direct descendants.

Karún. You have lately heard from Mr. Loftus, some interesting disquisitions upon that river. I have only to observe, in reference to it, that, if we were to occupy Mohamrah, and if there was any occasion to press farther upon Persia, then the natural course would be, to ascend the Karún into the open country of Susiana, instead of attempting to mount the impracticable passes between Bushir and Shiraz, which have been described in General Monteith's paper, and which I venture to say, are not to be forced by any army in front of an enemy. With respect to the physical geography of these passes, I consider General Monteith's description to be very accurate. When I saw them first, and still more when I first ascended them, I thought they were quite impracticable to any army; but after having been a good deal about Persia, and having taken guns up passes still more difficult, both there and in Affghanistan, I was satisfied as to the possibility of conveying artillery anywhere—provided there is no opposition. By putting a regiment to a gun, you may drag it anywhere by sheer force—up the Himálaya or the Andes;—and you may thus, of course, take it up these Persian passes; but the operation is not to be attempted in front of an enemy. I observe that Mr. Rich, a very good geographer, has the same idea that I have, as to the passes on the route to Shiraz. He says the roads in Persia are bad, but not nearly so bad as in Kurdistan; that the passes between Bushir and Shiraz are bad, but the passes between Senna and Sulimanieh are much worse. There is no occasion, however, I conceive, to attempt to force these passes. Another mode of attack would be far less difficult and equally, if not more, effective. The whole country to the north of the Gulf is perfectly open. The river Karún from Mohamrah is navigable almost up to Shuster; one of our steamers, indeed, has already made the ascent. Of course, at that time the steamer went up for the mere prosecution of geographic science, and without the slightest expectation that the knowledge obtained would ever be turned to political account; but I see that we do not get credit for disinterestedness; on the contrary, in a paper which was published in the last number of the "*Revue des Deux Mondes*," there are statements from which it would really appear, that the continental nations are disposed to think, that all our previous explorations, and travels, and wanderings in Persia, have been undertaken for the express purpose of preparing for this present war. I find it stated, indeed, that a friend of mine, whom I am glad to see present (Mr. Layard), and who at that time was travelling about the Persian Mountains for the purpose of copying inscriptions and acquiring geographical knowledge—I find it stated that his travels were carried on at the expense of Government, and for the express purpose of maturing the plans which are now being carried out. He is not mentioned by name, but is described in a manner which leaves no doubt of his identity. Now it so happened that while this gentleman was exploring the Bakhtiyari mountains, a steamer was going up the Karún at the same time, for the purpose of executing a survey of the river, and accordingly these two facts are put together in the paper alluded to, and it is inferred that this country must have been laying those plans fifteen years ago, of which we have the consummation in the present Persian war. Such is the consolation we get for our geographical ardour, and our desire to communicate our knowledge to the world.

To return, however, more particularly to the Karún:—the passage of our steamer up the river was no doubt of great use in showing us the navigability of the stream; but if it ever should be necessary to pass up the river into the interior, it is not to be supposed that one steamer, or two steamers, or half-a-dozen steamers will be sufficient to meet the requirements of the expedition—the invading army must, of course, march along the banks of the river, merely trusting to the flotilla for the conveyance of its stores and ammunition, and in ten days' march from Mohamrah it would reach the town of Shuster, which is situated in one of the best supplied districts in the whole of Asia. The town of Shuster moreover is extraordinarily strong in a military point of view, being defended on two sides by a great river, and with a wall and ditch at the base of the triangle leading from one river to the other. It is altogether one of the strongest military positions that I remember to have seen anywhere. The whole tract of country between the two rivers, is farther admirably irrigated, and is in fact one vast expanse of garden and cultivation. The only drawback that would be met with is the heat. In summer time the place is almost as hot as Bushir itself, although by no means so unhealthy, since at Bushir, it is not so much the heat as the humidity which creates unhealthiness, while at Shuster the climate is singularly dry. Should a British army, however, be encamped at Shuster, it must be understood that they will merely have the command of the country below the mountains. That alone is an important position. It would certainly be of great political importance to hold a province of this extent and richness at our command; still we must be careful not to run away with the idea that, because an army has advanced to Shuster, it is in a more favourable position for operating on Tehrán, than it was in at Bushir. It is in fact, all but impossible to penetrate into the interior of the country from Shuster, that is—

for an army to advance with all its supplies and materials of war. I have on different occasions traversed most of the passes which lead from the low country to the interior of Persia, and the only road which is practicable for guns, without extreme difficulty, is the pass on the high road from Bagdad to Kermanshah, and even that pass is far from easy. It was anciently named "The gates of Zagros," and is now called the pass of *Tak-i-Gerrah*, from an old Roman arched toll-house on the ascent of the mountain.* In the south there is a pass leading from Siráf to Shiráz, but Captain Lynch is I think the only English gentleman who has ascended it, and I am not aware that any account of it has been published. The two passes described in General Monteith's paper are both execrable, and the southern pass by Firozabad also suffers from want of water. Then, again, in the country of Susiana there are footpaths leading up the mountains in many directions along which several English travellers have passed, such as Mr. Layard, Mr. Loftus, and myself, but these are mere paths; they are not roads practicable to artillery; the only military route by which the mountains can be ascended from Susiana is along the valley of the Kerkha, but in that case the circuit is enormous. You have to follow the river almost as high up as Kermanshah, in order to get through the mountains and come out upon the plateau of Iran. I have myself taken guns by this route from Shuster on to the plateau at Kermanshah, but of course unopposed; and I do not think I could have ascended the passes in the face of an enemy. Having thus given a general description of the passes, of the rivers, and of the sea-coast, the only subject which remains to be noticed by me, in reference to this part of Asia, would seem to be the inhabitants. I mentioned before that the coast-line—the belt of low land that is along the coast—is exclusively inhabited by Arabs. Beyond them, towards the interior, you have warlike Persian tribes inhabiting the mountains. Immediately above Bushir, the Mamosenni are the principal people, and they have hitherto been particular friends of the British. *Bákir Khan*, son of *Walee Khan*, the old chief of *Kileh Sufíd*, has often been the guest of the Resident at Bushir. He is, I believe, at present the head chief of the Mamesenni, and in that capacity king of all the mountains, and accustomed to look to the English for assistance and protection against the Persian government. I once passed a day with *Bákir Khan* among the ruins of Shapúr, and was greatly pleased with him; he was indeed a general favourite with all Europeans who ever met him. He had been moreover in former days imprisoned by the Persian government, and consequently bore no good will towards them. Almost all these tribes, Persian as well as Arab, that is, the Mamesenni, the Dashti, the Tangistuni, are governed by chiefs who have been in habits of friendly commerce with us, and whom we know and esteem exceedingly; and I can never persuade myself to bring such men into the same category of national hostility with the officers of the Persian government; they have, in fact, no sort of feeling in common with the court of Tehrán. They are brave, honourable, independent men; and I do hope they will not be driven by the force of circumstances to become our blood enemies, like the chiefs of Affghanistan.* Above the mountains these warlike chiefs are to be met with in all directions; the chiefs of the Bakhtiyari, for instance, who are rough, wild fellows, but still much superior to the courtiers, artisans, and peasants whom you meet in the towns and villages. Some of them are very like the old Highland lairds, being able to bring into the field as many as four or five thousand men. Taken as a class they are, I should say, most estimable people. In the plains of Susiana the permanent inhabitants are Arabs; but the Lúrs come down also in the winter from the mountains to feed their flocks in the rich pastures of the Kerkha and Karún. The tribes to the north of Susiana, are wilder than the tribes to the south, and even more addicted to brigandage; but even they have their good qualities. I have not ventured to enter upon any details of physical geography, because, although there is a good deal to be said on that subject, the question of immediate interest refers rather to political geography. I may notice, however, before sitting down, that all the rivers running through the country of Susiana have at one time or other changed their courses. It was suggested, I think, by Mr. Loftus, on a previous occasion, that some of these rivers seemed to have formerly run in different beds; but I would go much farther, and undertake to prove historically that one and all the rivers have changed their courses, and that these physical changes have given rise to much political confusion. For instance, the original course of the river Karún was through *Guban* to the sea, and it was mainly owing to a great dam being erected at Sabla to raise the water of the river for the purpose of irrigation, that it came across and joined the *Bahmishir*. I am now speaking of later times; but Alexander is said, in antiquity, to have dug a canal from the Pasitigris to the Euphrates, along the line which has again recently become the river bed. The course of the Karún through Guban, was the original frontier between Persia and Turkey; but the river, having .changed its course, is still regarded as the frontier, and the Persians, in consequence, have got a large accession of territory, to which they have no political right. If you refer indeed to the old maps, you will see that Persia has no right either to the Guban territory or to the Island of Abadán. I do not remember that I have anything further to state on the geography of this part of the country. I see many gentlemen present who have travelled over the same regions, and who possess, no doubt, much information on the subject. I shall be happy both to listen to them, and, if required, to answer any questions.

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* *Tak-i-Gerrah* means "the arch holding the road." The present building probably dates from the time of Gotarzes or Vologeses, when the Parthian kings were supported, and even nominated from Rome, and is certainly of Western architecture. In earlier times the body of Molon, the rebel satrap of Media, was here erected on a cross by Antiochus.

The name of Zagros has long been a puzzle in geographical etymology. Remembering, however, that the inner face of the mountains is throughout the range named *Pasht-i-koh*, or "back of the hill," and that *Za-giri* has this exact signification in Skipetari, I cannot help suggesting such an explanation; and if it is asked what the Skipetari could have been doing in the Median mountains, I would point to the neighbouring city of *Holwan*, which is actually called Albania in the Peutingerian map, and has a nearly similar name in the Cuneiform Inscriptions; and I would further note the general use of the Arian term *Giri* for "mountain," throughout this part of Asia.

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* One instance of this change has already occurred which is greatly to be regretted, and which is ominous of future trouble. *Bákir Khan*, the old chief of the *Tangistunies*, was always on terms of intimacy with the British resident, and not unfrequently did good service to the British Government. His son, Ahmed Khan, however, on the occasion of the present invasion was driven into the ranks of our enemies, and fell at the head of his Tangistunies, when we stormed the old fort of Rishir. We are now, therefore, blood-enemies with this powerful tribe, for all time to come.

GENERAL MONTEITH, F.R.G.S.—I am not by any means so well informed on the subject as Sir Henry Rawlinson, but I was directed by Sir John Malcolm, in the first instance, to proceed to Shuster, to trace the river Karún, and particularly to visit the ruins of Susa. We marched by land along the shores of the Persian Gulf to Bassorah by Rohilla, Rig Gunnowa, Hissar, Delim, Shebulsha, Endecan Mashúr, and Darak, the capital of the Chab Sheik's territories; from thence traced the Karún to Shuster, and visited Desful and the ruins of Susa. Another object was to see by what routes the French, who were then expected to make the attempt, might advance on India. The principal route is that which Alexander is supposed to have followed. It leads from Shuster, through the valley of Hormuz, to Persepolis. There is a desert destitute of water for about eighty miles from the Karún to Ram-Hormuz. The people of the country have a tradition that a settlement from this place established themselves on the island of Ormuz, at the mouth of the Persian Gulf, which afterwards became so renowned for its wealth and commerce. I cannot say much for the road up the valley of Hormuz, leading through rice swamps, but the valley is beautifully cultivated. The passes there would be practicable for artillery with very little trouble, being only separated from the plain of Babahoon by a low range of hills. The celebrated pass, which was forced by Alexander, can be distinctly recognised about 10 or 12 miles from the Kalai-sefid. That Kalai-sefid I ascended, and remained there for two or three days. . It is the most singular place I ever saw, and rises 1500 feet above the level, and abounds in springs all round it. An artificial path has been cut, but it is so easily defended, that a small body of men could easily repel a large force. It was, however, taken by the Persians about twenty years ago. That was the last attempt made by the Persians to bring the tribes into some sort of order, for they are the greatest thieves in the world, plundering caravans, and everybody they possibly can. We were not robbed by them, owing to our strong escort of Persian troops. From this point there is a pass which would require to be repaired, and which would be forced without any great difficulty. Between this pass and Shiraz there is no great obstacle to be encountered. On returning from Bushir to Tehrán in 1820, I spent a month in examining the passes leading from Bushir to Shiraz, and thought them less formidable than they appeared to be. I had a good number of men with me, and I sent them up to the right and left to see whether these rocks, apparently inaccessible, could be gained, and I saw them in a short time crowning both sides of the pass. I took up twelve pieces of artillery; but with 500 men, and it took us three weeks to get them up. The plan I adopted, was to dismount the guns entirely and put them upon cradles made with trees. Twenty-four men to each gun, could only convey it a short distance; then they were relieved by others, and by that means we forced a way up the pass: of course that could not be done, if opposed, until you had crowned the heights. After passing the worst part of the first pass you could, by throwing a bridge across the ravine, reach a tract of country of much less difficulty. After passing through Konar-Tukht there is another pass, which descends towards Kazerún: here there is nothing but stones, which could be blasted or removed. From Kazerún you have a very strong pass, the Virgin's pass, which is carried almost up the perpendicular face of a steep hill; and the dilapidated condition of the parapet scarcely prevents cattle tumbling over. I followed the salt marsh down for about a mile, and saw a gap in the mountains which would require a bridge over the marsh. From that you get to the last pass, the Old Woman's pass, which is very steep but not very rocky, and a road could be made without any impediment. After that there is no further obstacle to Shiraz. I have only one thing to say as regards Chab, the country to the right of the Karún. In my day it was governed by a chief who was nominally subject to Persia. His predecessor cut a canal for the purpose not only of irrigation, but of turning the navigation, and bringing the commerce of that part of the country into his own territory. Some creek or channel must have been navigable, for I saw within the walls of the city some of the largest vessels, although there was not more than three inches of water at the time, but it could be augmented by returning the water of the irrigation canals into its natural bed. The vessels were about 300 or 400 tons burden.

MR. A. H. LAYARD, M.P., F.R.G.S.—Mr. President, as you have done me the honour to call upon me, I may perhaps say a few words, more to verify what Sir Henry Rawlinson has stated, than to advance anything new on the subject. I quite agree with him, that if this war is unhappily to be continued, the site of our operations, at least of the position which our army must hold, must be transferred from Bushir to the upper country, on the banks of the Karún, in the neighbourhood of Shuster. It is a very rich, fertile province, perhaps the richest of the whole of Persia. I am pretty well acquainted with the whole of that country, having resided there nearly two years; and as Sir Henry Rawlinson stated, I was not there with any evil designs. Indeed, I had not the remotest idea at that period that we should ever be engaged in warfare with Persia. The origin of my entering that country is principally attributable to the Memoir of my friend upon the site of the ancient city of Susa. Perhaps the best account I can give of it is to state shortly how I got there, which was not very easy at that time. My first intention was to penetrate through the centre of Asia; but at that period wars had broken out, and the roads were completely stopped. Instead of remaining idle at Ispahán I resolved to penetrate into the Bakhtiyari mountains. I had spoken to Mahomet Shah on the subject. At the time I had been taken prisoner by Mahomet Shah, for we had broken off our relations with Persia. I asked for permission to go into the Bakhtiyari mountains. The Vizier said that it would not be safe, as the tribes were hardly under Persian rule; that if I went I should be killed. I pressed for permission, however, and he drew up a paper, which I had to sign, and in which it was stated, that if I had my throat cut, it would be my own fault. I started off from Ispahán, and made acquaintance with the chief of the Bakhtiyari tribe. I made his acquaintance in a curious way. General Monteith says the people are robbers: they are certainly very quick in taking possession of people's property. There was a Frenchman at Ispahán making drawings of pieces of sculpture. I had seen a capital, and I told him to go and draw it. He went on horseback to the spot, and, having dismounted, took his sketch with the bridle of the horse over his arm. He was so much occupied with his work that some person came behind him, slipped the bridle off, and took away the horse. When the Frenchman had finished he found his horse gone. We made inquiries and found that it had been taken by a Lúr. This led to my making acquaintance with the Bakhtiyari chief. He said he was going to return to his country; and finally, at his invitation, I returned with him. We crossed a high mountain by a difficult pass, and came to the castle of the great chief. He was a most enlightened man; and in the course of a few years, by his talent, determination, and courage, had subdued the whole of these mountains, and could bring some 23,000 men into the field. By mere chance, knowing a little of medicine, I cured his little boy of a fever; and I remained with the chief a long time. I found him so intelligent that I proposed many things to him; among others, that he should open the rivers, establish schools, and introduce commerce. When I left him and came down the Karún, sounding all the way with a string, as far as Karak, which was then occupied by British troops, I told Captain Henneh, who was then political resident, what the chief wished, with the view to establish commercial relations with that country; and, at the same time, I wrote to the Chamber of Commerce at Bombay on the subject. I went back to the Mountains, and while there, I am sorry to say, the Persians marched upon the tribes.

There has been a question about the practicability of these mountain passes for guns. It is true they are very difficult roads, and, strictly speaking, not practicable to artillery. They are only practicable in the way described by General Monteith. When I was at Susa, the Persians marched from Ispahán and crossed the mountains, bringing with them several guns and a large body of infantry. They were not opposed. I may mention, that all the tribes there live in tents; their life is very interesting and very pleasant. When the warm weather comes, they live on the highest tops of the mountains, among the glaciers and snow; and, as the weather becomes colder, they gradually descend the sides of the mountains, and get into the valleys in the winter. Thus they almost always enjoy perpetual spring, and always verdure for their cattle.

The road from Mohamrah to Susa is perfectly practicable for artillery, supposing the country were held. The road is not difficult, and the mountains are easily crossed; therefore, as far as Susa is concerned, there is no difficulty whatever. The only difficulty is to cross the range of the Zardeh Kuh; whereas, from Bushir to Shiraz, the whole country is one mass of mountains and difficult passes. In the part of the country to which I have directed your attention, there are only one or two passes, which are no doubt difficult, but they are practicable for guns, because the Persians carried theirs over. The Persians came down to Susa, and there they began intriguing among the tribes. Unfortunately, in Persia and Turkey the governing authorities always have four or five chiefs, whom they play against the others. When one man is in the ascendant, they set four or five others against him. This is the way in which weak governments succeed in ruling over powerful tribes. There is no tribe in Persia equal in courage to the Bakhtiyari. When the Persians came to Susa they encamped. The tribes at first thought of attacking them, but the project was given up. The Bakhtiyari chief quitted his mountains, taking refuge amongst the Cháb Arabs, and came down to Fellahiyah. There a curious phenomenon took place. The Arabs destroyed the banks of the river about thirty miles above Fellahiyah, and by that means threw the water over the whole country, and made it an enormous lake. I then came down in a boat from Shuster to Ahwaz, with a party of what they call in Persia, Looties—dervishes and fellows who wander about, tear the skins of beasts, and play upon fiddles. When I got to Ahwaz, I found all my travelling companions were going to a holy place on the Euphrates, called Kerbula. At Ahwaz they began to make up their accounts, to see what money they had; when, finding that they had not a penny between them, they all began crying. I had a little money with me, about 5*l.*, which was all I had possessed for two years. However, when I searched my purse, I found all my money gone, and I was in the same condition as my friends; I had not a single half-penny; I had only a saddle with me. A Persian, seeing my difficulties, offered me five shillings for it, and I was obliged to accept it, and with that five shillings I hired a man and a mule to carry me across the country. When we reached the Fellahiyah river, we found that the Arabs had broken the banks and flooded the country. We got to a village towards the evening, and I found all the people preparing to go away. The mode they adopted was this:—In that country they have cottages made of reeds, and exceedingly pretty many of them are. They pull down these reeds, bind them together, make rafts of them, and float down the river to a place of security. In the night, my man, with his mule, ran away, and left me to my fate. In the morning, I found the villagers binding up the reeds and making rafts. I asked them to make room for me, but they refused; and they all went away, leaving me perfectly alone, surrounded by dogs and jackals, and other animals. I sat there some time driving off these beasts. At last I thought it better to do something for myself, bound some reeds, and made a raft, and in the morning floated down the river. It was very curious, like a scene in the 'Arabian Nights.' I floated down all the day, passing many of the rafts, and in the evening I came to a part where the river branched off into several canals. I went down one of these canals by chance, and presently I floated into the middle of a palace, in which there were a number of persons sitting round and smoking their pipes. The chief of the Cháb Arabs had built the house, and had carried a canal through it. I floated into the palace, and remained for some time with the chief, whose artillery I had the honour of commanding during the siege we sustained. At last, however, the Persian commander sent his relation, a Christian, with a Bible, and a great chief of the Mohamedan race with a Koran, and with this double shot promised the Bakhtiyari chief, if he would take the oath of allegiance, to send him back in safety to the mountains. The chief, not made wiser by the fate of his predecessors, went to the Persian commander, reassured by the presence of the Bible and the Koran, and was taken prisoner. I went with him, and was also taken prisoner; but I got away, and after that we had a long series of fights; and at last I lost all my friends. After wintering in the country four or five months, I at length quitted it. This sojourn there has given me rather a strategical knowledge of the country.

It is impossible to describe the beauty of the plains of Shuster, which form a perfect paradise at certain times of the year. At the end of February the rains cease, and, in a single day, the whole country is covered with a carpet of grass. The change is marvellous. You go to bed with the country quite yellow, and awake in the morning to find it perfectly green. The grass increases until May, and gets so high that horses can scarcely make their way through it. After May, the heat soon dries up the grass; it disappears as rapidly as it grew, and the whole country becomes again a parched and barren desert. The heat in summer is so intense, that it is almost impossible to live there; and I doubt whether any European troops could exist there in tents. The inhabitants are obliged, the whole of the day, to live in holes under ground, whence at night they issue and sleep on the tops of their houses. For three or four months in the summer it would be impossible to live in tents; but at a short distance from Shuster there are what they call the "yilaks," or summer quarters. You have only to ascend a little, and you get into rich mountain plains, where the climate is delicious, and where you may pass the summer months in security, and get an abundant supply of cattle, sheep, and other provisions. The plains below Shuster produce almost everything; in fact, it is one of the most productive countries in the whole world. I hope that, whatever may be the evils produced by the war, some good will result from it, and that the country will be opened up to the enterprise of the British merchant. The inhabitants are not bad people. During the time I was in these mountains I used to go about, from one end of the country to the other, without an attendant. On one occasion only I was plundered; and even then the chief got everything back for me. It was a common saying at that time, that a man might walk from Shiraz to Kermanshah with his hands full of gold, without being touched. The people in the plains are exceedingly quiet: they are our friends, and have always been most desirous to enter into friendly relations with us. I can give you a curious instance of this. I went up to Shuster on one occasion in a steamer under Captain Selby. At that time the river was very high. As the current was exceedingly strong, we did very well so long as we kept in the centre of the river; but Captain Selby was desirous of keeping as near as possible to the sides, where the water was still or dead. We had been aground many times through the day, and at sunset we again got aground. The men had been working very hard all day, and the Captain allowed them to go to bed, thinking he would get the steamer afloat in the morning. In the morning, however, we found ourselves in the middle of a corn-field, twenty feet from the river, so rapidly had the water subsided. In this dilemma, as I knew the people, I told them that the English had brought a steamer up for them to see, and were so anxious that the people should see the whole of her that they had put her aground. The people came round in crowds to see her; but we remained there six weeks before we could move her. As a measure of precaution, we erected defences around her in case of attack. We took out the engines, and almost lost them; for as soon as we had taken them out, the water rose as suddenly as it had fallen, and we had considerable difficulty in getting them into the vessel again. I think, as far as the inhabitants of the country are concerned, that we have nothing to fear from them.

COLONEL SYKES, F.R.G.S.—At what time of the year was that?

MR. LAYARD.—I think it was in April or May.

The PRESIDENT.—Will Sir Henry Rawlinson be so good as to offer some observations upon Herat?

SIR H. RAWLINSON.—I was asked a question just now by Mr. Frith with regard to Bassadore, which I will answer before entering on the subject of Herat. Bassadore is the name of the station in the Persian Gulf where the ships of our squadron have their several depôts, and where the general naval hospital is also established. It is situated on the island of Kishm, at its north-western point, and is the port at which all the ships usually touch in their passage up and down the Gulf, and where, on the present occasion, the fleet rendezvoused preparatory to the attack on Bushir. This position of

Bassadore was granted to us by the Imam of Muscat, to whom the island of Kishm belongs, at the period of our expedition against the pirates of the Gulf, and it has answered our purpose quite sufficiently up to the present time. It is possible, however, that in the course of the present operations the station may be changed; instead of Bassadore we may perhaps occupy the island of Karak or some other more convenient station. Bassadore is our own soil at present, but it is not a good position for a naval station. There is a great deficiency of water, and the place is too distant from Bushir and Bussora to be of any political weight. If we were able to exchange it for some other place nearer at hand, it would certainly be to our advantage.

With respect to Karak, I do not altogether agree with the observations contained in General Monteith's paper. Although the island is sufficiently supplied with water, and is moreover conveniently placed, it possesses the worst anchorage perhaps throughout the Gulf. If it ever become, indeed, a place of any importance, it will be so, not *in consequence* of its physical character, but rather *in spite* of it. The whole island is a mass of coral rock, and it is only one particular corner of it that is habitable. At this corner the rock is covered with a small patch of soil, which suffices for a scanty cultivation; here is erected the fort, around which are a few gardens, but there is no harbour, nor even a roadstead. Vessels ordinarily anchor out on the southern coast of the island, where they are sheltered from the prevailing north-westers, but immediately the wind shifts and blows from the south-east they are on a lee-shore; so that they generally have to lie with springs on their cables, prepared to slip immediately the wind shifts and run round the point for shelter; they lie again on the northern side of the point until a north-wester comes, then they have to return to the anchorage S. of the island. That is such a disadvantage for merchant vessels, that really I cannot contemplate the possibility of an island so circumstanced ever becoming a great commercial emporium. At present merchant vessels will never anchor off the island, unless compelled to do so; they used merely to pay short visits to the island during our previous occupation, taking up their permanent anchorage in Bushir roads. Owing to this great maritime defect I should be very sorry to see any attempt made to turn Karak into a commercial emporium, like those which previously existed in the Gulf, for I am confident such an attempt would fail. If it had been a place where it was possible to establish an emporium, no doubt it would have been selected for the purpose before this, as its geographical position is excellent. At the same time, as it happens to be in the line between Bushir and the mouth of the Euphrates, it may perhaps be of some use as a telegraphic station, and as such we might retain it, but I cannot see any other use for it.

Other questions have been addressed to me with reference to a subject which is almost too great to enter upon just at the close of the meeting. Still if the meeting be desirous to hear a few words upon the geography of Herat, I shall be quite prepared to offer them. I mentioned before that we have been twitted with ignorance on that subject. It is sufficiently discouraging to geographers, and especially to this Society, which has been established for the promotion of geography, that the great leader of the English press—which may be considered as the exponent of the intelligence of the English nation—should profess an entire ignorance on the subject of Herat, not only ignorance of its geography, but actually of the country to which it belongs. We were told not long ago that its position was not known within a degree of longitude, and that it was a doubtful point in political science whether it belonged to Affghanistan or Persia. Now I hardly think that is a fair statement of the case, and I am glad to see that such ignorance, either real or affected, has not been endorsed, generally, by the public feeling of England. If you cast your eyes on Mr. Walker's map of the N.W. frontiers of India, suspended on the wall, you will find Herat most accurately, scientifically, and clearly laid down, for the position was determined by Colonel Sanders, of the Bengal Engineers, by chronometer, by observation, and by triangulation, from the Indian base. The question as to whether it belongs to Affghanistan or Persia I will answer in a few words. Persia has belonged to Herat, but Herat has never belonged to Persia, as an integral portion of her territory. After the death of Timour (or Tamerlane), his son, Shah Rokh Mirza, established his capital in Herat, and during his reign the whole kingdom of Persia was thus in dependence on the city. After that time, Herat was generally an independent country. During the time, however, of the Seffevis, for a short period the Persians obtained forcible possession of Herat, as they also did of Bagdad, and so far as a right by conquest is concerned, they have as good a claim to one city as the other. The Seffevis were succeeded by Nadir Shah, who first placed the Dorani tribes in Herat. At his death Ahmed Shah instituted the Affghan monarchy, and from that time to the present Herat has always been an independent Affghan principality, so that the Persians cannot possibly lay any territorial claim to Herat. Having thus cursorily noticed the political character of the country, I will now say a few words with regard to its geography. It is frequently said that all the great lines of route through Asia centre at Herat, and that it derives its importance from this circumstance, but this is not by any means the case. Herat is of importance for the following reasons. Firstly, because it lies upon the high road from Persia to the Indies; there being no other route. Every caravan, indeed, army, or anything else, coming from the west, must necessarily march by Herat to enter Affghanistan. Then, again, the district round Herat is probably the richest in Asia; and there is this further peculiarity, which is a great military advantage, that in the same line there happens to be at a convenient distance another district of almost equal fertility. Herat is the first station, and Nishapore is the second. These two are situated at a convenient distance from each other, and can furnish supplies to an almost unlimited extent. To obtain a just idea of the fertility of the district, we have only to remember that the army of Mahomed Shah in 1838, from fifty to sixty thousand strong, remained in the neighbourhood of Herat for more than ten months, drawing supplies from the villages around without experiencing any scarcity. In that district there are four or five hundred rich villages with abundance of water, and the plain is one continued sheet of cultivation for 50 or 60 miles in extent. Lastly, the city itself is of extraordinary military strength, being surrounded by a great mound of earth, such as we call a "fausse-braie," of enormous height (80 or 90 feet high), and at a considerable slope. Upon the slope also is a double line of trenches with traverses to protect them from an enfilade fire. The place is thus quite strong enough to protect itself from any *coup de main* on the part of Oriental assailants; and if improved by a few scientific additions, such as flanking defences, escarpment of the ditch, &c., it would present a sufficiently formidable front even to a European army. In the recent affair, it must be remembered, it was not taken by the Persians, but it capitulated for want of provisions. The siege might have been protracted six months longer, without much risk of danger, if the garrison had been only furnished with supplies. From Herat to Candahar the country is quite open and sufficiently easy; there would indeed, to use a familiar illustration, be no difficulty in driving a four-in-hand the whole way. The mistake that we are in the habit of making in considering Herat, is that we put it in the same category with Cabul; but this is altogether wrong. It is an error that has obtained a general belief without any reason whatever. Herat has, in fact, no connexion with Cabul, either geographically, politically, or physically. The Cabul line to India is no doubt extremely difficult, almost impracticable for armies; whereas the country from Herat to Candahar, below the hills and so on to the plains of Sinde, is perfectly open, and practicable for troops in every direction. It should be remembered, indeed, that during the whole of the Affghan war we never had a reverse or even a check in Western Affghanistan, with the exception of that single affair of Sir Richard England's at Hykelzye; so that it is hardly fair to place Herat and Candahar in the same category with Cabul. At present the Persians are in occupation of Herat, and we are at war with Persia for the purpose of compelling her to evacuate the city and restore it to the Affghans. It is to be hoped, and I confidently expect, that the war will have that effect. But if it be otherwise, if the Persians do not evacuate Herat, then comes the question, what are we to do? It is very currently believed that the forces sent up the Gulf, are for the purpose of marching on Herat; but that is an absurd idea, that could never have entered into the imagination of any person acquainted with the country. The country between Shiraz and Herat, being for the most part a salt desert, is perfectly impracticable to an army; but I am not prepared to say that, in a geographical, physical, or military point of view, there would be any difficulty in marching a force from our own Indian frontiers to Herat, in order to expel the Persians from the city. I should be sorry to see such a campaign undertaken, because of the expense; but the movement is perfectly practicable, and would almost certainly be successful, if we were content with the one definite object of recapturing Herat. In the former Affghan war, all our disasters arose, it might be remembered, from alterations of the original plan. Having marched through Affghanistan and placed Shah Shuja on the throne, our work was accomplished, and we should have retired, but, instead of returning, we remained in the country, and thus exposed ourselves to disaster. In the same way, if we were now to march upon Herat, and, having expelled the Persians, were to insist on remaining in military occupation of the place, we might be subjected to great difficulties on account of the exceptional position of the country. In England, we are apt to forget that the social condition of Affghanistan, is different from that of any other eastern country. Throughout Candahar and Herat, and partially in Cabul, the lands are in possession of a privileged class, the Dorani aristocracy. These chiefs possess great power, and are, in fact, the lords of the country, holding their vast estates on a sort of feudal tenure, and having the peasantry under them. Now the Doranis would necessarily be put on one side, if we were to assume the government of the country; and foreseeing their fate, they would thus be predisposed to become our enemies. It would be vain indeed to attempt to hold the country, unless the Doranis were removed; and although the Persians might not scruple to undertake such a work of depopulation, the English of course could not accept its responsibility. In the times of Sennacherib and Tiglathpaleser, such things were often done,—whole nations were transported fr m one country to another, and similar means are still occasionally resorted to in the East, for taming a turbulent population. But the British Government, in the nineteenth century, could not of course be a party to any such proceeding. I repeat, therefore, in conclusion, that if we are content to march on Herat, expel the Persians, and return to India, there is no difficulty or danger in the enterprise; but that, if we attempt to retain a permanent footing in the country, we shall inevitably incur disaster.

The PRESIDENT, in conveying the expression of the thanks of the meeting to Sir Henry Rawlinson, regretted that the lateness of the hour alone (it being near eleven o'clock) prevented a more lengthy discussion on the subject then under notice. He saw present several travellers who, from their personal knowledge of the country, could no doubt have afforded them very valuable information. He must, however, adjourn the meeting until the 23rd instant.

Eighth Meeting, Feb. 23, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Walter Bryant; John Gilchrist; and Z. D. Hunt, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*The Hon. A. Kinnaird,* M.P.; *Capt. W. A. Willis,* R.N.; *Lieut. J. H. Glover,* R.N.; *and H. M. Addey; E. Coghlan; D. Stewart Dykes; T. K. Fletcher; S. L. Howard; and J. S. Sherrin,* LL.D., *Esqrs., were elected Fellows.*

DONATIONS.—The following were among the donations since the former meeting:—The 'Atlas Geografico Estadístico é Historico de la Republica Mexicana,' par Antonio Garcia y Cubas, presented by the author, through General Almonte, the Mexican Minister; the 'Map of Scinde,' in four sheets, by the Quartermaster-General (Bombay) Colonel Neil Campbell, presented by Lieut. Watson; a copy of 'Meteorological Observations made during the progress of the Survey of Ireland,' by order of the Secretary for War, and further contributions from the Ordnance Map Office, consisting of 274 sheets of Yorkshire, on the scale of six inches to a mile; the 6-inch maps of Fife, Kinross-shire, and Linlithgowshire; plans of several towns on the 5-feet scale, extending to 1360 sheets; maps of Aldershot, &c., presented through Colonel James; No. 18 of Dr. Blackie's Imperial Atlas; MS. Maps of 'Bahia de Todos os Santos,' presented by E. Porter, Esq., F.R.G.S., &c.

ANNOUNCEMENTS.—It was announced that a letter had been received from Sir J. C. Melvill, Secretary to the Honourable East India Company, informing the Council that the Society would be furnished with a complete set of the Company's charts, together with nautical directions and other maps and works relating to geography.

EXHIBITIONS.—The PRESIDENT called attention to the bust of Dr. Livingston, by Mr. Miller.

AUDITORS.—Thomas H. Brooking and E. Osborne Smith, Esqrs., on the part of the Council; and H. Raper, R.N., and Francis Le Breton, Esqrs., on the part of the Society, were appointed Auditors.

The papers read were:—

1. The Secretary read extracts from notes on the Expedition up the Nile, communicated to him by M. Le Comte d'Escayrac de Lauture. The naval portion of the expedition under the command

of our countryman, Mr. Twyford, although with great difficulty, had ascended for the first time with steamers the celebrated cataracts of the Nile, and early in January had arrived in the town of New Dongola. The Count, however, had been obliged to suspend operations until the next season.

Colonel Sykes, v.-p.r.g.s., said he held in his hand a letter from the Comte d'Escayrac de Lauture to the Secretary. In it he complained that the Germans attached to the expedition threw impediments in the way. He also said that the Austrians had a mission at Khartúm, on the White Nile; and when the Pasha sent troops for the safety of the traders up the river, he found that the Austrian missionaries had distributed little Austrian flags, which had produced a great effect in Egypt, as if they were going to act the part of the Spaniards in South America. The Comte adds—"I am very glad that it was an Englishman who achieved this first success in thus ascending the cataracts of the Nile. With respect to Twyford, I have thought it right to increase his salary." Then, he continues, he had no doubt this great enterprise would experience very great obstacles; "but with the two people, the English and French—France bold, and urged on by the love of glory; England patiently indifferent to obstacles, and always looking to the future—there can be no doubt about the ultimate results of the expedition."

The President said that M. d'Escayrac had already distinguished himself by the excursions he had made in Africa. He was a French gentleman who had devoted himself to the cause of geography, and was therefore entitled to the consideration of that Society. He had, at the request of the Pasha, invited gentlemen of different countries to accompany him in this expedition, and it was gratifying to find that with none of his companions had he been more satisfied than with Mr. Twyford, the young English sailor.

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2. *Proposed Communication in Asia Minor, between the Lake of Sabanja, the River Sakaria, and the Gulf of Nicomedia.* By General Jochmus.

Communicated by Sir Roderick I. Murchison.

History establishes that in ancient times the utility had been already recognised of a communication between the Black Sea and the Gulf of Nicomedia, by means of canals which should connect, on the one hand, the river Sakaria with the lake of Sabanja, and on the other, this lake with the Gulf of Nicomedia, directly, or by way of the little river Kara-su.

Down to the end of the last century, the question of this system of canalization had been seven times agitated; *first* in the time of the kings of Bithynia; *next* under the Emperor Trajan; *then* under two Byzantine Emperors—Anastasius and Alexis; and again during the reigns of the Sultans Bajazid II., Mohammed IV., and Mustapha III.

In ancient times there were technical objections to the execution of this great enterprise; a magnificent Roman bridge 800 feet in length, however, still exists, which, in the environs of Ada-bazár, thrown across one of the natural outlets of the lake Sabanja into the Sakaria, attests the importance which the imperial (Roman) government attached to the means of communication in the rich province of Nicomedia. At a later period, under the Ottoman Emperors, measurements and levels had already made known the facility and the incontestable advantages of the hydraulic works then projected.

The Grand Vizier in the year 909 of the Hegira (A.D. 1503) caused the following facts to be made known.

The distance from the river Sakaria to the lake of Sabanja is 9600 siraas (or 19,200 French feet, or about 3⅞ miles). The distance from the lake to the Gulf of Nicomedia is 22,000 siraas (or 44,000 French feet, or scarcely 9 miles). The difference of level nowhere interposes a difficulty.

Between the Sakaria and the lake there already exists a natural communication by the little river of Sari-déré; and according to the report of Sinan Pasha, it was intended to form a direct canal there,—or rather merely to deepen the bed of the Sari-déré, and to cut a canal throughout the distance of only 2200 feet. To effect the more important communication, that between the lake and the gulf, Sinan Pasha wished to cut a direct canal between Nicomedia and the lake; but it must be observed that the Roman governor Pliny proposed to the Emperor Trajan, either a direct canal, or one considerably deviating from a direct line, which he projected to communicate with the river at present called the Kara-su.

In the year 1172 of the Hegira (A.D. 1758), the Grand Vizier, Raghib Pasha, revived the same enterprise, in order to give occupation to the poor of Constantinople, then threatened with famine by the failure of arrivals of corn from the Black Sea; and he gave the direction of the works to an Hungarian, the celebrated General de Tott, who was at that time in the service of the Sublime Porte. The Memoirs of the Baron de Tott* prove that there exists no technical difficulty to oppose the execution of these hydraulic works; but the project was nevertheless abandoned, because, the famine having been stayed, popular commotions at Constantinople were no longer feared. The historiographer, Wassif Effendi, however, has related that some individuals, interested in hindering the projected canalisation, found means to bribe certain influential public officers, who caused the works to be discontinued, the traces of which are still to be seen.

Raghib Pasha had it especially in contemplation, to insure for the capital, in time of peace, as well as of war, by means of an internal communication, plentiful supplies of corn, provisions, and wood, independently of the customary arrivals from the Black Sea and the Mediterranean.

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* *See* Von Hammer.

The idea of connecting the Black Sea and the Gulf of Nicomedia through the lake Sabanja was again taken into consideration during the reign of Sultan Mahmoud, of glorious memory; but it seems that a certain Osman Effendi represented that the establishment of this system of canals might facilitate the entrance of a hostile fleet from the Black Sea into the Sea of Marmora, or even military operations against the capital; and these considerations were amongst the principal causes of the last abandonment of this great and noble enterprise.

The danger is altogether imaginary. The undersigned has travelled through the provinces of Nicæa, Nicomedia, &c., and he is firmly convinced that no hazard to Constantinople can arise from the canalisation in question. It is not intended to establish a water communication for ships of the line and frigates, but rather for coasting vessels and small steamboats; and thus to provide for the capital all the advantages of an extensive internal navigation, and a means for the continual and cheap supply of wheat, barley, straw; wood for fuel, carpentry, and shipbuilding; charcoal, and other articles of daily consumption.

The country around the Lake of Sabanja, and all along the river Sakaria both upwards and downwards, is remarkably rich in timber and vegetation, and is capable of the highest culture. Though even at present in a very satisfactory and prosperous condition, its productive powers are susceptible of very great augmentation. It is superfluous to add, that the city of Nicomedia, and the public establishments already existing or to be founded there, would derive considerable advantages from the canals indicated. It may, besides, be considered certain that the tolls to be paid by vessels, as well as the augmentation of the public revenues, and of the value of the forests and other state property in the province of Nicomedia alone, would pay the most liberal interest for the capital expended on the hydraulic works.

What has been stated as to the advantages offered to Constantinople and the province of Nicomedia, relative to the supply of provisions to the capital by means of an internal communication, will also apply nearly in an equal degree to the country around the Lake of Nicæa. The distance from the Lake of Nicæa to the Gulf of Gemlik is nearly the same as that from Lake Sabanja to the Gulf of Nicomedia, with the difference, however, that there already exists a natural communication between the waters of the Lake of Nicæa and those of the sea. It would, then, only be necessary to form into a canal this channel, by which water from the lake is discharged into the sea, to secure a way for the water-transport of the products of its shores, scarcely a fourth part of which are cultivated.

On the two great Lakes of Nicæa and Sabanja there does not exist at present a single vessel of transport, whilst there are a hundred and sixty small vessels on the Lake of Apollonia, which carry on a lucrative commerce with Constantinople by way of the river of Muhalitch; although the banks of this lake are not nearly so rich or important as those of the Lake of Nicæa, or especially as those of the Lake of Sabanja.*

Constantinople, 25*th May*, 1846.

The PRESIDENT said this was one of several communications, most of them of greater length, on the comparative geography and ancient encampments in Greece and Asia Minor, prepared by the General and sent to the Society. These would in time be laid before the Fellows in the publications of the Society.

MR. W. J. HAMILTON, F.R.G.S., said, that although he had not visited the particular district alluded to by General Jochmus, he was acquainted with some of the physical features of the country almost immediately connected with it. As far as he had been able to follow the paper, it appeared, with regard to the canalisation between the lake Sabanja, the river Sakaria, and the Gulf of Nicomedia, that General Jochmus proposed that the lake Sabanja should be the principal source whence the water would be derived for the purpose of canalizing the district and supplying the different sluices. He imagined that the bed of the river Sakaria, flowing as it did between a mountainous region and the Black Sea, must be at a higher level than the lake Sabanja; consequently the water would flow from the river into the lake. He did not mean to say that that would offer any great difficulty. The district was one of the best watered in Asia Minor. The Sakaria rose in the interior, and had a very abundant supply of water; and, therefore, if the river Sakaria was higher than the lake Sabanja, would not offer any material obstacle. But the country between that district, and extending northward to the Black Sea, was very mountainous; and the probability was that the river must flow at a considerably higher level than the Sabanja. Between the lake and the Gulf of Nicomedia there was no great difference of level. The country also being a mountainous one was not likely to offer any of those facilities for navigation which it appeared the Turks contemplated at a former period, and which was one of the reasons why they objected to give any sanction to the undertaking. The other lake mentioned by General Jochmus he was not acquainted with. The lake Apollonia certainly had a communication with the Sea of Marmora, but from what he saw in the neighbourhood of the town of Apollonia, he should not have imagined there was anything like the number of vessels mentioned by General Jochmus. It might be so. The country, particularly to the northward, was very fertile; vineyards and silk abound; and the trade with Constantinople was very considerable. There could be no doubt that the opening out of this system of canals between Sabanja and Sakaria would very materially facilitate commercial transactions from the Sea of Marmora to the Black Sea.

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* Constantinople, 31st May, 1847.

M. Hommaire de Hell, to whom I communicated this memoir, addressed a note to his Excellency the Grand Vizier, Reshid Pasha. His levels are founded merely on approximative data; and although it might be less expensive to make a railroad between the Lake of Sabanja and Nicomedia, an inspection of the ground between the Lake and the Black Sea, which down to the present time has not been examined by M. de Hell, will probably prove that the establishment, in that part, of a canal would be more practicable and perhaps also less costly. There still remains the consideration of the double or triple embarkation and shifting of goods, necessarily expensive, if a railway were to form a part of the line, and the transport were to be effected partly by the Lake of Sabanja, then by land, and lastly by sea. M. de Hell is in error if he believes himself to be the first person who has taken the elevation of the ground in question, as Von Hammer has indicated the exact levels, twice estimated in 1503, by order of the Turkish government, between the Lake of Sabanja and the Sea of Marmora, as well as between this lake and the Sakaria; but there is a great difference between the results obtained in 1503 and in 1847.

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3. *On the Geography of the Sea of Azov, the Putrid Sea, and the adjacent Coasts, with Remarks on their Commercial Future.* By Capt. SHERARD OSBORN, R.N., C.B., F.R.G.S. [*Abstract.*]

AMONG the hydrographical features of the Sea of Azov, the author alluded to the configuration of its bottom, which, at the greatest depth, seldom exceeding 40 feet, forms a flat in the centre of the basin, extending about 55 miles east and west, and 35 miles north and south. Between this flat and the coast the bottom slopes for the most part gradually, the inclination being generally one foot in a mile between the depths of 30 and 40 feet, and rather more abruptly in shallower water. The regularity of this slope is, however, occasionally interrupted by banks, adjacent to some of the remarkable sandy spits which characterise the coasts of this sea. The Obitochna Banks, S.E. of the spit bearing that name, are attributed to volcanic action, the effects of which in this sea were distinctly exhibited in the occurrence of a submarine eruption in Temriuk Bay, in 1799, described by Pallas. Volcanic phenomena in various forms also occur on the peninsulas of Kertch and Taman. The only rock known to exist within the whole extent of this sea was discovered near the north coast, eastward of Berdiansk, and has been called after H.M.S. Vesuvius.

The sandy spits are constantly extending, and present a steep face, rising out of deep water, against the current from the east; while towards the west they form shoals which are always increasing. These spits are inhabited by fishermen employed by wealthy companies, and wild fowl abound on them. The constant extension of the spits appears to be accompanied by a general diminution of depth, which is said to have amounted to 6 feet in 127 years. This result is hastened by the discharge of ballast from trading vessels, which the author observed in the form of knolls, all over the bottom near Taganrog, and in the bights off Berdiansk and Mariopol. These knolls form nuclei for fresh alluvial deposits.

The author also described at some length the winds and currents of this sea. He pointed out the influence of the winds on the depth of the water, which strong breezes had the effect of blowing away on the one side and heaping up on the other. The spits afford a shelter against easterly winds, but there is no protection in any part of the sea against the westerly gales. With reference to the currents, the author differs from M. Taitbout de Marigny, who asserts that there is little current in the Sea of Azov. This is maintained to be an error, and the influence of the winds on the motion of the water is regarded as a sufficient indication of the existence of currents, and various examples were given on this point. The rivers also contribute to produce currents from three quarters, viz. the delta of the Don, the Sivash, and the rivers between Taman and Kamisheva. From the entrance of the Gulf of the Don the current passes in three branches:—1st, along the north coast, as indicated by the direction of the spits, at the rate of a knot or a knot and a half per hour; 2ndly, through the centre of the sea, on a S.S.W. course, with a velocity of about one knot per hour; and 3rdly, in a direction nearly due south to Kamisheva Point, curving round from thence to the Jelezin Bank, where it connects itself with the outflow from the deltas of the Kuban, Protok, Beysough, and runs out through the straits of Yenikali.

The physical features of the Spit of Arabat and of the Sivash or Putrid Sea were described from observations made during the late campaign, and the author also dilated upon various topics relating to the surrounding regions, dwelling considerably upon the importance of the Ciscausian Region, both geographically and commercially, and pointing out that it forms the natural highway to Persia and Northern India from Central Europe. Captain Osborn said that a traveller might yet go from *Vienna* to *Asterabad*, *viâ* the Danube, Black Sea, Valley of the Kuban, and Caspian, in a fortnight.

The PRESIDENT returned thanks to Captain Sherard Osborn for his communication, so remarkable for the variety of subjects touched upon. It embraced, in fact, the history of the southern regions of Russia. But there were some points connected with the Sea of Azov to which he should like to recall attention. For example, the title of the paper was upon the commercial future of the Sea of Azov; but Captain Osborn had not told them how many hundreds of years would elapse before the whole of the Sea of Azov was filled up. He—the President—had been along the northern edge of that sea, and could bear testimony to the fidelity and accuracy which Captain Osborn had displayed in his description as to the great mass of matter brought down the Don, and the way in which it accumulated on one side of the spit and edged round to the other, and as to the uniform character of these spits, being precipitous on the east side and shelving on the west. He would ask whether, in observing these spits from Berdiansk to Taganrog, Captain Osborn had noticed that they were composed of a solid subsoil of tertiary rocks, which on the east side had been eaten down into precipices by the action of the sea, while on the other it was covered with merely alluvial accumulations? He apprehended that these spits were erosions of ancient tertiary cliffs, with which he was tolerably acquainted himself. Another point, upon which Captain Osborn had remarked, was that there were portions of the sea very saline, and others not so. That phenomenon existed, not only throughout the Sea of Azov, but also in the Caspian, and was due to the presence of subterranean salt-rocks which cropped out here and there in great masses. The Russians could have any amount of rock-salt they pleased. The modern Azov must be far from the ancient town, as in the great siege, ships went up to the walls of the town.

Captain Osborn said that the statistics to which he referred affirmed that the sea had diminished six feet in 127 years. If it continued at that rate, it would fill up in 350 years; still he thought the Don and other large rivers which discharge into this sea would always cut a channel for themselves. The Russians asserted that the Caspian had deepened, although there was no outlet out of the Caspian, and two or three large rivers discharged themselves into it on the northern side. Having stated that in 1672 the Russians found six feet of water on the bar of the Volga, and in 1743 twelve feet, he was told that at Asterabad, the Persians could point out villages under water and trees that had been covered, and that where animals could ford at one time, there were now two fathoms of water. It was a question, therefore, whether there might not have been a subsidence in the bed of the Caspian, and whether the Sea of Azov might not be preserved in a similar manner. If the calculations were correct that it would be filled up in 350 years, he thought it must have been filled up along ago. With reference to the spit, it was evident, as Sir Roderick Murchison said, that there had been a rock as a nucleus for the spit to form upon. Beyond these spits again, he found knolls formed by the discharge of ballast from vessels. Around these knolls the mud was deposited rapidly, forming perfectly cone-shaped shoals, and in a short time a series of these soon got connected together. If some means were not taken to put a stop to this system, the sea would in a short time hardly be navigable.

Mr. Laurence Oliphant, F.R.G.S., said, it was five years since he went over these countries, still he could quite corroborate what Captain Osborn said with respect to the current in the Sea of Azov.

The commercial aspect of affairs in that country was very interesting to a stranger. The prohibitive system of Russia had nowhere been more strongly developed than there, and its deleterious influence was clearly perceptible. Kaffa was the natural outlet for the commerce of that country, but the Russian government had forced the commerce to go by way of Taganrog and Kertch. In judging of the period that would elapse before the Sea of Azov filled up, it would be necessary to take into account the conduct of the Russian officials. The Sea of Azov had been in existence 2500 years, to our certain knowledge, and they could hardly calculate that it would fill up in 350 years. But the Russian officials were doing all they could to fill it up. Vessels arriving at Taganrog were strictly forbidden to throw out ballast, but upon payment of a bribe, the Russian officials allowed it to be thrown out. The consequence was, that, as Taganrog prospered, the harbour got filled up, and in time he supposed it would be so prosperous that there would be no harbour at all. The import duties levied by the Russian government were so high that vessels could only go in ballast. With respect to the country of the Don Cossacks, which he had crossed from one end to the other, he could only say that a more dreary, desolate, and detestable country he never travelled over. The Tchernozième, or black soil peculiar to the country, might produce fine corn, but it was wonderful how little corn could be seen in crossing the country. He saw plenty of dried-up grass.

The PRESIDENT.—In what season?

MR. OLIPHANT.—In October; but still he did not see evidences of cultivation. The idea which forced itself on the mind, in considering this fertile country teeming with resources, was, not that it was improving rapidly, but that it should have improved more rapidly. The country between the Kuban and the Caucasus was one of the most magnificent in the world. It consisted really of savannahs; the grass in the valleys grew six or eight feet long. The character of the country of the Don Cossacks was quite different; there the steppes were undulating, like a sea in a heavy swell. There was no nation, he believed, that understood less the development of the resources of a fertile region than the Russian. If it had been in the hands of the Americans, the aspect of affairs would have been very different. Were they to possess it for twenty years, the harbours, instead of being choked up, would be used as the natural outlets for the produce of the country, if they were available for the purpose, nor would places be chosen for ports which were the very worst that could be selected. Taganrog, Kertch, Gheisk, ought not to be ports at all. He would explain why Kaffa was the natural outlet of the country. At Taganrog, vessels had to anchor several miles off the coast, and the corn which was brought down the Don, had to be reshipped four times before it was finally deposited in the hold of the vessel, after it had passed through the straits of Kertch. Whereas, if Kaffa was the emporium, lighters could come right down even from Tcherkask without ever taking out their cargo, and the whole commerce of the country would be concentrated there. He believed Kertch was a pet place of Prince Woronzoff, and Taganrog was created by the Emperor Alexander; these places had been selected not because they were the natural outlets for the country, but because certain individuals took a fancy to them.

The PRESIDENT.—It is the fact that the natural filling up of the sea has occasioned them to move ports farther towards the water.

MR. OLIPHANT.—Just so. The anchorage at Taganrog is 20 miles off.

CAPTAIN OSBORN.—There is an anchorage about 6 miles off straight south of Taganrog.

MR. OLIPHANT.—The merchant vessels were at anchor an immense distance off when I was there.

Ninth Meeting, March 9, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Capt. W. A. Willis,* R.N.; *Lieut. William Chimmo,* R.N.; *Dr. J. S. Sherrin; and D. S. Dykes, T. K. Fletcher, and S. M. Howard, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Col. P. Anstruther,* C.B.; *Capt. W. J. Eastwick; the Rev. Dr. Elder; the Right Hon. Lord Falkland; Commander F. K. Hawkins,* R.N.; *Dr. E. Hamilton,* M.D.; *Capt. Jenkin Jones; Col. the Hon. W. L. Pakenham; the Lord Bishop of St. David's; Sir Justin Sheil,* K.C.B.; *the Earl of Shelburne; Sir W. Fenwick Williams of Kars, Bart.; and R. Sinclair Aytoun, E. G. Culling Eardley, Thomas Gillespy, W. B. Green-*

field, G. W. Lennox, W. B. Long, J. C. Marshman, and A. Swanzy, Esqrs., were elected Fellows.

DONATIONS.—Among the principal donations received since the last Meeting, were Plans and Sections, published by the War Department; 'Percement de l'Isthme de Suez, etc.,' by M. F. de Lesseps; and the Journals of the Scientific Bodies of France, Prussia, the United States, and Canada.

EXHIBITIONS.—Lieut. W. Chimmo, R.N., F.R.G.S., exhibited certain relics connected with the search for the North Australian Expedition under Mr. Gregory, found on the coast of the Gulf of Carpentaria and on the banks of the Victoria River, and referred to in his Paper in the 'Proceedings.'

ANNOUNCEMENTS.—1. The President said that a letter had been just received from Captain Richard Burton, announcing his arrival at Zanzibar, on the east coast of Africa, and his intention to proceed, as speedily as possible, for the interior, in search of the Great Lake.

2. The Twenty-sixth Volume of the 'Journal,' and the Seventh Number of the 'Proceedings' of the Society, were next announced as having been published that day.

3. It was then announced that a letter had been received from the Earl of Shelburne, enclosing, by direction of the Earl of Clarendon, a copy of a despatch from Her Majesty's Minister at Lisbon, stating that the Viscount de Sa da Bandeira had, by order of the King of Portugal, transmitted the vote of thanks, passed at the Special Meeting of the Royal Geographical Society on the 15th of December, to the Portuguese Authorities of East and West Africa, for their kind reception of the intrepid Dr. Livingston.

Address by Sir Roderick Murchison on Opening the Meeting of the Royal Geographical Society, March 9, 1857.

GENTLEMEN,—An attachment resulting from and cemented by an intercourse of nearly thirty years' duration would naturally have led me at our last meeting to express to you my grief upon the occasion of the decease of my valued friend the Earl of Ellesmere; but the grave had not then closed over his remains.

Now, that the sad ceremony has been performed, in the presence of many a true mourner and amid the wail of a devoted tenantry, I cannot allow this the first opportunity presented to me to pass, without giving utterance to the feelings of sincere sorrow which I experience, in common, I am sure, with all members of the Royal Geographical Society, upon the loss of such a man.

Of him, I may well say that his whole career was as honourable to himself as it was useful to his country; for his knowledge of our pursuits was one only of the many accomplishments in science, letters, and arts, which his bright mind had mastered, whilst his urbanity, benevolence, and kind-heartedness, shone forth in every transaction of his well-spent life.

This is not the time, Gentlemen, for me to dwell longer on the lofty character of our deceased former President; but at the ensuing Anniversary it will be my earnest endeavour to prepare, with what power I possess and all the love I bore him, a brief biographical sketch of one, who, whether we judge him by his private or his public worth, was pronounced by all who knew him to be the perfect type of an English Nobleman.

The papers read were :—

1. *Remarks on the Geography and Hydrography of South-Western Africa.*

By JAMES CAMPBELL, Esq., Surgeon, R.N., F.R.G.S.

H.M.S. 'Plumper,' St. Philip de Benguela,
February 18th, 1856.

THE river Zaire, or Congo, is the largest arterial stream of Western Africa south of the equator, and discharges itself into the ocean in lat. 6° to 6° 08′ S., and long. 12° 12′ E. It was explored for some distance, in 1816, by the expedition under Captain Tuckey, R.N., and is laid down as having an E.N.E. direction up to the termination of his ascent. The object of this voyage appears to have been for the purpose of ascertaining the correctness of the theory promulgated by Park, viz., that this river was identical with the Niger, and constituted its embouchure, which has long ago been negatived by the explorations of the Landers. It was surmised by Captain Tuckey and others, that its source was to the northward of the equator, in a large lake or lakes, probably not far from the southern declivity of the Donga mountains; but the periods during which it undermines its banks, as evidenced by floating islands, increase of current, and height of water at its mouth, point to a different direction.

The wet season in the Bight of Biafra extends from May to October, and the quantity of rain that falls is enormously great; but even in the dry season, which comprises the remaining months, there are sudden though temporary deluges. On the sea-board of the Congo country—and we may assume its interior to be similarly season-governed—there are two showery seasons: one from October to December, and a second from March to May. These, as compared with the rains of the windward and leeward coasts north of the equator, do not deserve the appellation of "wet season," for the showers are of no duration or intensity. In the interior, however, the fall must be considerable, and, indeed, at a distance of thirty miles from the entrance of the river a marked increase of rain is experienced. As it is during those so-called "wet months" that the Congo is at its highest level—December in particular—we may justly conclude that its source, or at least the parent stream—should a confluent really exist to the north—is within a few degrees south of the latitude of its mouth, but at a great distance inland. This hypothesis is strengthened by the recent exploration and traverse of Southern Africa by Dr. Livingston, who saw a large river in lat. 11° 17′ S., and between the 22° and 23° E. long. He has mapped it under the names Casai, or Loke, and describes it as about 120 yards broad at the above position. The stream was forded at the same place, and was described by intelligent natives to form the Zaire or Congo river. It was flowing to the N.E. He also forded another large stream called the Coango or Quango, "the Tortuous," in the valley of Cassangé, the width of which was about 150 yards, and flows nearly north. This river was forded in 9° 51′ 28″ S. lat., and about the 19° of E. long. The inhabitants and Portuguese traders described it as flowing into the Congo.

I apprehend this traveller's data will decide the geographical position of the source of the River Congo.

The hydrographical features of this river have been displayed by Captains Owen and Vidal in their survey of its entrance; but they and others appear to have omitted two peculiarities connected with its seaboard and bed:—

First.—That the crescentic portion of land extending from a little to the southward of Point Padron to Shark Point, is evidently due to the reproductive effects of marine and fluviatile action. On the river-side, the large Bay of Diegos skirts the annexed land, and in some places dips into it in the form of creeks. This portion is densely covered with the trees and bushes usually seen at the entrance of tropical tidal rivers, and has a black loam with fine sand for a soil. It is very little elevated above the sea, and is flat. This bay is of little depth, has a muddy bottom, and I believe will, at no distant era, be reclaimed from the river by the silting up of this part of its bed. The sea-bordering portion, on the contrary, is more sparingly covered with vegetation; there are none of the giant mangroves to be seen, and its trees are of much less altitude. The soil is composed of attrited shell, mixed with sand, and is considerably elevated—about 15 feet—above the sea; so that in crossing the narrow belt from seaward it forms a miniature hill before reaching the alluvial detritus on the river-bank. Having had my attention called, whilst serving on the Newfoundland coast, to the action of the sea in raising a sandy spit between and joining the French island Miquelon, I feel confident that the ridge or ridges—for a succession of them can be detected—have been thrown up by the heavy surf, which occasionally sets heavily on shore. The extremity of Shark Point and its projecting shoal have evidently extended since I saw them in 1845. It is, moreover, an universal rule on the south coast of Africa for headlands or rivers to have a spit or reef off their southern or left bank; but the majority, no doubt, owe the sandbank to the continual action of the South African current.

Second.—That on the right bank, or rather off Red Point, there are a number of holes in the sea-bottom, which, I imagine, are produced from the tearing away of the soil by the violence of the current, as it is there it flows with greatest force and frequency.

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2. *On the Quilimane and Zambesi Rivers.* From the Journal of the late Capt. HYDE PARKER, R.N., H. M. Brig 'Pantaloon.'

Communicated by Captain J. WASHINGTON, R.N., F.R.G.S.

THE Luabo is the main outlet of the Great Zambesi. In the rainy season—January and February principally—the whole country is overflowed, and the water escapes by the different rivers as far up as Quilimane; but in the dry season neither Quilimane nor Olinda communicates with it. The position of the river is rather incorrect in the Admiralty chart, being 6 miles too much to the southward and also considerably to the westward. Indeed, the coast from here up to Tongamiara seems too far to the westward. The entrance to the Luabo River is about 2 miles broad, and is easily distinguishable, when abreast of it, by a bluff (if I may so term it) of high straight trees, very close together, on the western side of the entrance. The bar may be said to be formed by two series of sandbanks,—that running from the eastern point runs diagonally across the entrance and nearly across it. Its western extremity is about 2 miles outside the west point.

The bank running out from the west point projects to the southward 3½ miles, passing not one quarter of a mile from the eastern or cross bank. This narrow passage is the *bar passage.* It breaks completely across at low water, except under very extraordinary circumstances. At this time—low-water—a great portion of the banks are uncovered; in some places they are 7 or 8 feet above water.

On these banks there is a break at all times, but in fine weather, at high water, a boat may cross near the east point. There is very little water, and, in places, a nasty race and bubble, so that caution is requisite. The best directions for going in over the regular bar-passage, according to my experience, are as follows: Steer down well to the eastward of the bar-passage, so as to avoid the outer part of the western shoals, on which there is usually a bad sea. When you get near the *cross-bar*, keep along it till the bluff of trees on the west side of the entrance bears N.E.; you may then steer straight for it. This will clear the end of the *cross-bar*, and, directly you are within that, the water is smooth. The worst sea is generally just without the bar-passage.

Within the points the river widens at first and then contracts again. About 3 miles from the Tree Bluff is an island; the passage up the river is the right hand side of it, and deep. The plan will best explain it. The rise and fall of the tide at the entrance of the river being at springs 20 feet, any vessel can get in at that time, but, with all these conveniences for traffic, there is none here at present. The water in the river is fresh down to the bar with the ebb-tide, and in the rainy season it is fresh at the surface quite outside. In the rainy season, at the full and change of the moon, the Zambesi frequently overflows its banks, making the country for an immense distance one great lake, with only a few small eminences above the water. On the banks of the river the huts are built on piles, and at these times the communication is only in canoes; but the waters do not remain up more than three or four days at a time. The first village is about 8 miles up the river, on the western bank, and is opposite to another branch of the river called "Muselo," which discharges itself into the sea about 5 miles to the eastward.

This village is very extensive, and about it there is a very large quantity of land in cultivation; calavances, or beans, of different sorts, rice, and pumpkins, are the principal things. I saw also about here some wild cotton, apparently of very good quality, but none is cultivated. The land is so fertile as to produce almost any without much trouble.

At this village is a very large house, mud-built, with a court-yard. I believe it to have been used as a barracoon for slaves, several large cargoes having been exported from this river. I proceeded up the river as far as its junction with the Quilimane river, called "Boca do Rio," by my computation between 70 and 80 miles from the entrance. The influence of the tides is felt about 25 or 30 miles up the river. Above that the stream, in the dry season, runs from 1½ to 2½ miles an hour, but in the rains much stronger. The banks of the river, for the first 30 miles, are generally thickly clothed with trees, with occasional open glades. There are many huts and villages on both sides, and a great deal of cultivation. At one village, about 17 miles up on the eastern bank, and distinguished by being surrounded by an immense number of bananas and plantain trees, a great quantity of excellent peas are cultivated, also cabbages, tomatos, onions, &c. Above this there are not many inhabitants on the left or west bank, although it is much the finest country, being higher and abounding in cocoa-nut palms; the eastern bank being sandy and barren. The reason is, that some years back the Lanelines, or Caffres, ravaged all this country, killing the men and taking the women as slaves, but they have never crossed the river; hence the natives are afraid to settle on the west bank, and the Portuguese owners of the different "prasos" have virtually lost them. The banks of the river continue mostly sandy, with few trees, except some cocoa-nut palms, until the southern end of the large P. of Nyangué, formed by the river about 20 miles from Maruru. Here the country is more populous and better cultivated, the natives a finer race, and the huts larger and better constructed. Maruru belongs to Señor Aseredo, of Quilimane, well known to all English officers on the east coast for his hospitality.

The climate here is much cooler than nearer the sea, and Aseredo has successfully cultivated most European as well as tropical vegetables. The sugar-cane thrives, as also coffee and cotton, and indigo also is a weed. Cattle here are beautiful, and some of them might show with credit in England. The natives are intelligent, and under a good government this fine country might become very valuable. Three miles from Maruru is Mesan, a very pretty village among palm and mango trees. There is here a good house belonging to a Señor Ferrão; close by is the canal of communication between the Quilimane and Zambesi rivers, which in the rainy season is navigable. I visited it in the month of October, which is about the dryest time of the year; it was then a dry canal, about 30 or 40 yards wide, overgrown with trees and grass, and, at the bottom, at least 16 or 17 feet above the level of the Zambesi, which was running beneath. In the rains, by the marks I saw, the entrance rise of the river must be very nearly 30 feet, and the volume of water discharged by it enormous.

Above Maruru the country begins to become more hilly, and the high mountains of Boruru are in sight; the first view of these is obtained below Nyangué, and they must be of considerable height, as from them they are distant above 40 miles. They are reported to contain great mineral wealth; gold and copper being found in the range, as also *coal*. The natives are a bold, independent race, who do not acknowledge the Portuguese authority, and even make them pay for leave to pass unmolested. Throughout the whole course of the river, hippopotami were very abundant, and at one village, a chase by the natives was witnessed. They harpoon the animal with a barbed lance, to which is attached, by a cord 3 or 4 fathoms long, an inflated bladder. The natives follow in their canoes, and look out to fix more harpoons as the animal rises to blow, and, when exhausted, despatch him with their lances. It is, in fact, nearly similar to a whale-hunt. Elephants and lions are also abundant on the western side; the latter destroy many of the blacks annually, and are much feared by them. Alligators are said to be numerous, but I did not see any.

The voyage up to Maruru occupied seven days, as I did not work the men at the oar, but it might be done in four; we returned to the bar in two and a half days.

There is another mouth of the Zambesi, 7 miles to the westward of Luabo, which was visited by the 'Castor's' pinnace; and I was assured by Lieut. Hoskins that the bar was better than the one I visited.

The PRESIDENT, in inviting discussion on the subject of these papers, referred especially to Dr. Campbell's communication, which, he said, was replete with interest in geological and geographical points of view.

DR. LIVINGSTON pointed out on the chart various rivers that he crossed in the district of the Congo, which, he said, flowed generally towards the centre of the country, and then turned away to the north. When he came to the Quango, he found it running due north, and the Portuguese whom he met, who had been making inquiries amongst the natives, told him that they believed it to form with the Kasai, the Congo or Zaire. He understood from some officers he met at Loando, that there was an immense body of water, discharging itself into the sea; he thought it might be possible to navigate the Kasai or Loke down to the sea, and on his return he had intended to go some distance down the river, to ascertain that point. When he came to Cabango, he met some people who came from a town under a chief called Mai, and they informed him that at that town there was a large waterfall on the river, and that after it passed the waterfall, the river joined the Quango. The Kasai was much the largest river, and when it joined the Quango it became the Zaire. He asked one of the men to imagine himself standing in the town of Mai, and to point out the confluence of the Kasai and the Quango. The man pointed west, and said, "Five days in that direction, the Quango and Kasai join together and form the Zaire." He also said he believed there was another branch coming from the north. If persons did not believe the accounts of these natives, it would be well if they would go and examine for themselves. With regard to the Zambesi, he came down that river at a different time of the year from that at which Captain Parker went up to the beginning of the delta—the point at which he, Dr. Livingston, left it, being severely attacked by fever. Having traced on the chart the course of the Zambesi and the Quilimane river and their slight connection with each other, Dr. Livingston said, he was informed by the Portuguese, that Captain Parker had come to the end of the delta, and was delighted with the appearance of the river up to that point. The mountains mentioned by Captain Parker were those opposite Sena. They formed a very high range, about 8 or 10 miles long, and at the top was a hot, sulphureous fountain. The people who lived on the mountain had been fighting with the Portuguese; hence the latter declined to accompany him there. On the opposite side there was a very high mountain to be seen in the distance, called the Gorongozo, with certain inscriptions on its top. It was famed for its salubrity and the purity of its waters, and the Jesuits, accordingly, had a settlement there. Below that point the river was capable of bearing a very large vessel, but as he had only seen it at its height, he could not be supposed to know its capabilities at any other time of the year. He had lately received a note from Lieutenant Hoskins, who served under Captain Parker, and this gentleman stated that he perfectly agreed with what he, Dr. Livingston, said in reference to the Quilimane river not being the Zambesi at all:—

"The Zambesi appears to have five principal mouths, of which the Luabo is the most southern and most navigable; Cumana, and two whose names I do not know, not having myself visited it, lying between it and the Quilimane, and the rise and fall at spring-tides on the bar of the Luabo is 22 feet; and, as in the passage, there is NEVER less than 4 feet (I having crossed it at dead low-water—springs), this would give an average depth sufficient for any commercial purposes. The rise and fall is 6 feet greater, the passages narrower and more defined, consequently deeper and more easily found than that of the Quilimane river. The river above the bar is very tortuous, but deep; and it is observable that the influence of the tide is felt much higher in this branch than in the others; for whereas in the Catinna and Cumana I have obtained drinkable water a very short distance from the mouth, in the Luabo I have ascended 70 miles without finding the saltness perceptibly diminished. This would facilitate navigation, and I have no hesitation in saying that little difficulty would be experienced in conveying a steam-vessel of the size and capabilities of the gunboat I lately commanded as high as the branching off of the Quilimane river, which, in the dry season, is observed many yards above the Luabo; though I have been told by the Portuguese that the freshes which come down in December and March fill it temporarily. These freshes deepen the river considerably at that time of the year, and freshen the water many miles from the coast. The population of the delta, except in the immediate neighbourhood of the Portuguese, appeared to be very sparse. Antelope and hippopotami, the former tame and easily shot. I inquired frequently of both natives and Portuguese if slavers were in the habit of watering there to ship their cargoes, but could not ascertain that they have ever done so in any except the Quilimane. With common precaution the rivers are not unhealthy; for, during the whole time I was employed in them (off and on during eighteen months), in open boats and at all times of the year, frequently absent from the ship for a month or six weeks at a time, I had not, in my boat's crew of 14 men, more than two, and those mild, cases of fever. Too much importance cannot be ascribed to the use of quinine, to which I attribute our comparative immunity, and with which our judicious commander, Commodore Wyvill, kept us amply supplied. I hope these few remarks may be of some little use in confirming your views of the utility of that magnificent river.

"A. H. H. HOSKINS."

It appeared to him, Dr. Livingston, from all the information he could obtain, that this branch of the Zambesi was navigable for ships of some burden, provided they entered at spring tides, but he should not recommend a gunboat to be sent up the river. Although a large vessel might go up without any difficulty, as far as Tete, for some months when the river was full, it would be advisable, in any attempt to ascertain its navigability, to send a vessel of the very lightest draught, otherwise it might get stuck on some bank in a very unhealthy part of the river, and the whole attempt might be frustrated by disease.

In answer to an inquiry from Mr. Galton, Dr. Livingston stated that there were no obstructions in the river lower down than 20 miles above

Tete. There are many reedy islands, but open spaces between them, in which the deep channel is always found. At a range of mountains called Lopata, the river was narrowed, but very deep, and it was at least 300 yards broad at the narrowest part. Twenty miles above Tete, there was a rapid, which he, unfortunately, did not see, as he was obliged to leave the course of the river at that part, in consequence of numerous rivulets which, filling with the rising river, interfered with his progress. The rapids consisted of a number of rocks, jutting out of the stream, which were very dangerous when the water was low. Higher up, was a crack or fissure made through a high ridge of land for about 30 miles, through which the river ran, forming the most wonderful sight he had ever seen. He thought the fissure must have prevented the Portuguese of old from going up by way of the river, and he believed they never went into the valley in that neighbourhood, which should be regarded as an English discovery. On an island there, called Kalai, he saw the grave of a chief with 70 elephants' tusks planted round it, rotting in the sun and rain, and 30 tusks on the graves of his relatives; and all through the country elephants' tusks were similarly used as gravestones—a use to which he believed they would not have been applied, even in the case of the chief, if they could have found a market for them. It was the same as at Lake Ngami, where the tusks were allowed to rot for want of a market. A trader who accompanied him on the occasion of the discovery of the lake, purchased 10 tusks for a musket worth 15s. A market having been established, the tusks would no longer be allowed to rot; in fact, so fond were these people of traffic, that he believed they would rob their fathers' graves, if they could get a penny by it. Wax, also, was often thrown away, because no market was found for it. As soon as the opportunity of selling it presented itself, there could be no doubt that the natives would collect and dispose of it as they did in the west. One great object which he proposed to himself in going back, was to endeavour to make the Zambesi a permanent path for commerce. He had no doubt that if the people on both sides found there was a certainty of getting their goods purchased, they would cultivate and collect the produce of the country most willingly, for one remarkable feature in African tribes was their great desire for barter. He often found great difficulty in passing through some of their villages, the natives trying to stop him and his party, so that they might remain long enough to be compelled to buy their supper. If they only remained to supper, they could get off pleasantly enough the next morning. Several Englishmen and Frenchmen had formerly asked for liberty to go up the Zambesi, but they had been always refused permission to ascend. We had been guilty of that sort of dog in the manger policy ourselves, and were not therefore in a position to look down upon the Portuguese for acting in the same manner. He had been told, however, that they had lately made all the ports on the east coast of Africa perfectly free to commerce.

MR. J. CRAWFURD, F.R.G.S., asked the distance from the mouth of the Luabo to the fissure described by Dr. Livingston?

DR. LIVINGSTON replied that the distance was between four and five hundred miles by way of the river.

MR. CRAWFURD.—And do you consider the river navigable for four or five hundred miles?

DR. LIVINGSTON.—With the exception of those first rapids. It is nearly 300 miles up to the first rapid, and the fissure is 150 miles past that.

MR. CRAWFURD said if the river was navigable, he could not understand how the Portuguese, who were so close to it, should have always preferred the Quilimane. They had been in the neighbourhood almost from the time of Vasco de Gama, and he could not conceive how they could have been so absolutely stupid as not to have discovered that there was a superior branch of the river close to them. But if the river really was navigable to the extent of 300 miles, what advantage would a vessel get by going there? None, so far as he could see. Was there any shelter or harbour for its protection? The district was within the sphere of the monsoons, and there must be occasional typhoons or hurricanes; evidently no trading could be carried on. He never knew people so stupid and backward as not to know what to make of their wax and honey. The Portuguese, being close at hand, ought to have a market for their ivory and beeswax. It was mentioned in Captain Parker's paper, that cocoanuts abounded at the junction of the two rivers: that, however, was by no means a proof of fertility, but the reverse; it was an evidence that the spot was near the sea, and the cocoanut thrived generally in a very poor soil, in mere sand. Captain Parker stated also that there was wild indigo; but he should like to know of what kind. There was wild indigo in almost every tropical country in abundance, but the great thing was to cultivate it and manufacture it skilfully. It was a long time before the Hindoos, who had manufactured indigo for two or three thousand years, could compete with the article brought from South America. That did not happen until the process introduced from the West Indies was superintended by Europeans. It would require land of the greatest fertility, and a peaceable and well-established government, capital, and European skill, to enable the Africans to grow a pound of good indigo.

CAPTAIN NOLLOTH, R.N., in reply to Mr. Crawfurd, said there was no shelter or harbour at the entrance of the river; but that was no reason why ships might not visit it, if the river was navigable. It was not safe, however, for a large vessel to anchor within seven or eight miles from the mouth of the river, on account of the heaps of sand.

The PRESIDENT.—Do you suppose that if smaller vessels were employed to go up the river, larger vessels could anchor in the neighbourhood with safety?

CAPTAIN NOLLOTH.—I have anchored there with safety.

The PRESIDENT.—And there was no dangerous wind blowing on shore?

CAPTAIN NOLLOTH.—None.

DR. LIVINGSTON said 'The Grecian' had visited the Luabo in 1853, and the master thought that a vessel of considerable size could easily go in there, and be completely land-locked and out of observation. He said also that a short time before, he believed a brig under American colours came in and shipped slaves at that port. He (Dr. Livingston) had a drawing from a Portuguese pilot, who told him that there was a good harbour. It was certain that there was an immense body of water flowing into the sea, and naval officers who had gone there declared that it was fit for commercial purposes. Mr. Crawfurd had asked what a ship could get by going up the river. The same question might have been put in 1849 to Mr. Oswell and himself, when they went to Ngami. Neither Mr. Oswell nor himself picked up a single tusk of ivory, there being fortunately a difference of tastes in the world; but a trader who went with them, filled his waggon with ivory, and made a good thing of it. He asked some Portuguese at Quilimane, how it was they were so stupid as to build the capital of Sena at a place which had no connection with the river of Sena, the Zambesi; and they stated that when Quilimane was founded, the river flowed that way, but that it was now filled up. Quilimane was not a place that any man in his senses would ever think of settling at, except for the advantages of trade. It was built on a great mudbank, with mangrove bushes on both sides of the river, and if you dug down two feet you came to water. The walls, which were made of brick, often sank in, so that the bottoms of the doors had to be cut off, the floors not sinking to the same extent.

The indigo exported from the district in question was said to be very good, and also from Natal, pieces of the same plant had been shown in this country, having the peculiar copper mark, which the best indigo was said to possess. Whatever its character however might be, it certainly dyed blue, and some of the natives called it the "changer." He did not hold out any great expectations of much gain to be realised immediately. He did not suppose that a great trade would spring up at once, but he had such confidence in the resources of the country, that he intended to devote a portion of his life to their development. If legitimate commerce could be established in that large tract of country, it would be the best means of putting a stop to the slave-trade.

MAJOR VARDON, F.R.G.S., said it would appear from statements that had been made, that the hippopotamus was very easily speared; but he had always been under the contrary impression.

CAPTAIN NOLLOTH explained that where vessels had got over the bar, to which allusion had been made, they could ride in perfect safety inside.

Tenth Meeting, *March* 23, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Capt. W. J. Eastwick, of the Bombay Army; Lieut. J. H. Glover,* R.N.; *and W. B. Greenfield, Esq., were officially introduced upon their election.*

ELECTIONS.—*T. W. Bramston, Esq.,* M.P.; *Dr. James Campbell,* R.N.; *Major-General W. G. Moore; the Earl of Munster; Captain Laurence Trent Cave; and William Reed; George R. Smith; Robert Sweeting; and John Vincent, Esqrs., were elected Fellows.*

DONATIONS.—Among the donations since the former Meeting, were —Map of the country of Cape May, State of New Jersey, U.S., presented by E. L. Viele, Esq.; Geometrical Projection of two-thirds of a Sphere, by Colonel James, R.E.; Transactions of the Madras Literary Society; the Bengal Asiatic Society; the Franklin Institute of Pennsylvania, *etc.*

ANNOUNCEMENTS.—In opening the business of the Meeting, the President announced the receipt of a letter from the eminent Prussian geographer, Carl Ritter, in answer to an anxious inquiry of his own respecting the health of his illustrious friend, Baron Humboldt; and he was truly happy to state that that great man had completely recovered from a momentary attack which had not in the slightest degree impaired his brilliant mind, the continued application of which was of such vast importance to the progress of science. He was happy to see how truly the merits of Dr. Livingston were appreciated by so competent a judge as M. Ritter, who speaks of our countryman as one of the noblest and greatest characters the black race has ever seen.

The PRESIDENT next stated that the Astronomical Observations by

Dr. Vogel and Corporal Maguire, in Central Africa, had been received from the Foreign Office, through the kindness of the Earl of Clarendon; also a copy of a Despatch from Her Majesty's Consul at Tripoli, enclosing a copy of a letter from Corporal Maguire, dated Kuka, November, 1856, announcing the reported assassination of Dr. Vogel at Wadai. Sir Roderick remarked that this was a mere report, and cautioned the members against placing much faith in it, reminding them that similar statements had gained circulation of the death of several other African travellers, who had afterwards, and as he hoped would be the case with Dr. Vogel, returned to this country alive and well.

In quitting the subject of Africa, he had farther to announce that the renewed maritime expedition to the Niger, as advocated by the Society, would soon quit our shores, commanded by the same competent observer and naturalist, Dr. Baikie, F.R.G.S., who had formerly succeeded so well; and he had great pleasure in recording the praiseworthy and efficient manner in which the Earl of Clarendon had again countenanced this important national enterprise.

Sir Roderick then stated that he had received a communication from Sir J. Herschel, enclosing a portion of a letter from Mr. Maclear, Her Majesty's Astronomer at the Cape, in which he remarks that "Dr. Livingston's observations had been reduced and sent to England. The exploit of crossing the African continent from west to east, and of perseveringly fixing, by astronomical observations, the interesting features of the path, combined in placing the poor missionary pre-eminently in the front rank of the most celebrated explorers."

In connection with this subject, the Chairman informed the Meeting that the Government of Portugal had sent out orders to Mozambique to support Dr. Livingston's late companions at the public expense of that province, until his return to claim them.

The Chairman next alluded to the energy displayed by Mr. H. Babbage, at the imminent risk of his life, in overcoming great difficulties when deserted and alone, and to the talent with which he had endeavoured to detect gold-bearing rocks in the vicinity of Lake Torrens, in Australia, and in tracts unknown to Europeans.*

Lastly, he had the satisfaction to state that the expedition under Mr. Palliser would proceed in a fortnight to its starting point on Lake Superior, with the view of surveying vast tracts of British North America, as yet most imperfectly known, particularly the country watered by the affluents of the Saskatchevan, and with the ulterior view of examining the southern portion of the Rocky Mountains in our territories, and possibly of discovering a new practicable passage through them, to Vancouver Island.

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* *See* 'Adelaide Observer,' Nov. 22, 1856.

He farther stated that Dr. Hector had, on his recommendation, been appointed the geologist, naturalist, and medical man to the expedition, whilst Lieut. Blakiston, R.A., F.R.G.S., was to make magnetical observations, as instructed by General Sabine, and the botanical collection as recommended by Sir W. Hooker and Dr. Hooker.

Under these circumstances, the President hoped that an expedition which had originated in the recommendation of the Council of the Royal Geographical Society to Her Majesty's Government, would be very efficiently and successfully completed under the direction of the Colonial Office, and especially of Mr. John Ball, the Under-Secretary, who had undertaken the task with such zeal and knowledge of the subject.

The Rev. C. G. NICOLAY, F.R.G.S., understood that one summer was to be spent in examining the district between Lake Superior and Lake Winnipeg. With due deference to those who had made this alteration in the original plan of the expedition, he thought this would be a mere waste of time. Amid such a network of waters as lay between these two lakes, nothing definite could be done in one summer, and the route itself was already sufficiently well known through the officers of the Hudson's Bay Company and others. He also understood that the first winter was to be spent at Fort Charlton, which was several hundred miles out of the line originally recommended by the Society to be explored. Before the expedition started, he really hoped the instructions would be reconsidered. The great object should be to press across the plains to the south of the Saskatchevan, and get to the Rocky Mountains as soon as possible.

The PRESIDENT said Mr. Nicolay had really expressed his own opinions and the opinions of the Council of the Society. The Government, however, appeared to have other objects in view besides mere geographical discovery; he hoped, therefore, that Mr. Nicolay would not press the subject farther at present.

The papers read were :—

1. *Notes of a Journey eastwards from Shiraz to Fessa and Darab, and thence westwards by Jehrúm to Kazeran in* 1850. By Mr. Consul KEITH E. ABBOTT.

Communicated by the Earl of CLARENDON.

[This paper will be printed in full in the Journal.]

GENERAL MONTEITH, F.R.G.S., said it was a considerable number of years since he visited this country. He was directed to survey the Passes from Bushir to Shiraz and the plain of Kazeran; and the route was so minutely surveyed that he thought there was no geographical feature that remained to be ascertained. Kazeran he considered a great military point, as it commanded the entrances of the valleys. It was a beautiful region, well watered, and, if cultivated, would be highly productive. He saw there the largest orange-tree he had ever met with, it being 40 feet in height. From Kazeran commenced the most difficult passes. About nine miles from Shiraz was the pass called the Virgin's Pass, which was, in fact, a flight of steps, protected by a very low parapet wall, yet exceedingly dangerous to pass. It was constructed at the private expense of a merchant, who said he had lost more of his mules in one year than the road cost. To the right of it a good road, however, might be made, without great difficulty, as it was but two miles over, altogether. From this point the *route* descended into a fine wooded valley, and proceeded along till it reached the Old Woman's Pass, which was about four miles in length. This pass was neither so steep nor so rocky as the other. Beyond this came a succession of well-watered and well-cultivated valleys. The cultivation of the plain of Shiraz itself was limited, owing to the want of water, as the small stream which passed the town was used to water the gardens and fields in the vicinity. Sculptured rocks of the kind alluded to by Mr. Abbott, were to be found in every part of the province. At Kazeran there is a stalactite cave, 100 feet deep, and at the bottom there was a statue which had been thrown down, and the water which formed the stalactite had attached it to the bottom of the cave.

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2. *Proposed Search for Dr. Leichhardt's Missing Party.* By SAMUEL SIDNEY, Esq.—(Author of 'The Three Colonies of Australia').

MR. SIDNEY said the paper had been transmitted to him from Australia, by one of the squatters in the most northern district of the province of New South Wales, who had resided fourteen years in the wildest part of the colony, who had himself conducted exploring expeditions in search of "Runs," into districts never before trodden by white men, and who therefore was entitled to speak with all the authority of experience on the subject of the evening – the probable fate of Dr. Leichhardt. The last intelligence received of Leichhardt was contained in a letter dated Cogoon, April, 1848. At that time he expected to reach Swan River, in about three years. The great length of time which had elapsed since Leichhardt's departure, was no proof of his death, because if supported by hunting, which he must be, he could only proceed at the rate of three or four miles a day, and would not leave any place where game was plentiful, as there are many in the oases of the interior. Dr. Leichhardt had, on former occasions, lived on friendly terms with the aborigines and been fed by them, when they were at the same time at war with neighbouring stockowners. The northern Bushmen do not believe the story brought by Mr. Hovenden Hely, that Leichhardt was murdered on a creek 150 miles from Wandaigumbal, on the Condamine. They say that the remains of pack saddles, found by Mr. Hely, were not those of Leichhardt's party, but of two squatters, who were lost in the Bush. They observe that although it is well known that cattle will return 600 miles to their homes, especially if attacked and dispersed by blacks, not one of Leichhardt's large lot has ever been seen—a positive proof that he had penetrated too far for them to return.

They maintain that the route which Leichhardt took on his last expedition, was in all probability on Sir Thomas Mitchell's track, as far as that officer reached to the North. From thence, in his attempt to proceed westward, he was too practical a Bushman to attempt a desert so fearfully illustrated by Sturt; that he would be sure to follow on one side of the coast range or backbone of the colony, to make sure of water and the greatest probability of food;—that he probably reached the longitude of Port Essington, and in endeavouring to push on south-west from thence, has got into some difficulty—perhaps depending on some friendly tribe for food. The south-west being in all probability badly watered, no prudent man would attempt to cross it, except in a wet season, and therefore Leichhardt might be stuck fast with a desert between him and water, waiting for a wet season to travel. That the wild blacks, less ferocious than those on the borders of the pastoral districts, would be likely to retain him among them as a curiosity or deity;—or that he may be gradually winding his way back, hunting for food, at the rate of three or four miles a day;—that therefore if it took him three years to reach the spot where he had to turn back, it would take double that period to return to the point of his departure.

Mr. Sidney's correspondent concludes by suggesting an Expedition in search of Leichhardt, which has been planned by practical northern Bushmen. It should consist of fifteen disciplined aboriginal troopers of the native police force, under the command of Frederick Walker, the late Commandant of that force, who had volunteered to serve without pay or remuneration of any kind, with 60 horses, 45 of which to be laden with supplies—meat rations to be obtained by the hunting blacks. The expedition should start from the farthest station in the Port Curtis district, and get upon Leichhardt's tracks, which would be plain for twelve or fourteen years in a country unoccupied by cattle. As Leichhardt always marked trees at his camp, and his cattle would travel in single file and denote his route, the black troopers would follow these like blood-hounds, and infallibly find Leichhardt's party or bring back his papers, the brands of his cattle, or other complete solution of the mystery that now hung over his fate.

The expedition should be met by a coasting vessel at some convenient point, and provided with supplies for a second year.

Mr. Sidney concluded by observing that nothing was to be expected from the Home Government; or from the New South Wales or Sydney citizens, with whom explorers and exploring expeditions were alike unpopular. It rested with men of science and wealth to subscribe the three or four thousand pounds needful for ascertaining the fate of, and perhaps rescuing, the man who had sacrificed everything to the cause of geographical science.

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3. *Return of the North Australian Expedition*, under Mr. A. C. GREGORY.

Communicated by G. F. LESLIE, Esq., F.R.G.S.

Burnett District, 2nd December, 1856.

SIR,—I have the honour to inform you of the arrival of the North Australian Expedition within the limits of the settled parts of New South Wales, and transmit for the information of his Excellency the Governor-General a brief outline of the proceedings of the expedition.

From the time of landing the horses at Point Pearce in September, 1855, to the 9th May, 1856, the party was employed in preliminary details, and the exploration of the country to the south of the Victoria River, having penetrated the interior deserts to latitude 18° 20′ south, and longitude 127° 30′ east; a detail of which I forwarded by the 'Tom Tough' schooner, viâ Copang, and which doubtless has already come to hand.

The schooner 'Tom Tough' having been seriously damaged in ascending the Victoria River, and a quantity of stores and provisions thereby destroyed, I instructed Mr. Baines to embark that portion of the expedition which was not required to form the land party, and to proceed to Copang for supplies, and thence to the Albert River in the Gulf of Carpentaria, to co-operate with the land expedition.

On the 21st June I left the encampment on the Victoria River, with a party of six persons, viz., Mr. H. Gregory, Mr. Elsey, Dr. Müller, and three men—Dean, Bowman, and Melville.

The arid nature of the country in the interior of Northern Australia compelled us to increase our latitude to 15° S. in order to pass the central parts of Arnheim-land, after which we kept parallel to the coast as far inland as water could be found in the rivers, the greatest distance from the sea not exceeding 100 miles.

Reaching the appointed rendezvous at the Albert River on the 30th August, the schooner had not arrived, and from some marked trees, it appeared that Her Majesty's Ship 'Torch' had sent a boat up the River a few weeks previous, but it was evident that this visit had no reference to the expedition, as the only marks left consisted of the names of some of the crew, which they had amused themselves by carving on the trees and stumps; and the ashes of their fire.

Under these circumstances, I deemed it not advisable to wait the arrival of the schooner, and having marked trees, and buried instructions for Mr. Baines at a spot which had been previously agreed upon, we left the Albert on the 3rd September, and made some ineffectual attempts to proceed to the south-east, but want of water compelled me to pursue a route parallel to the coast to latitude 17·20 S., when the Gilbert River enabled a S.E. course to be again pursued.

Crossing the Heads of the Lynd in 18·40, we reached the Burdekin on the 16th October. Our route was then along the right bank of that river to the junction of the Suttor River, which was followed up to the Belyando River. Tracing that river to latitude 22°, we then pursued a south-east course to the junction of the Comet and Mackenzie Rivers, and thence our course to the Dawson brought us to Messrs. Connor and Pitt's station, on the 22nd November.

I am now en route to Brisbane, where I purpose to leave the horses until arrangements can be made for their disposal, and proceed direct to Sydney.

(Signed) A. C. Gregory,
Commander N. A. Expedition.

To His Excellency the Governor-General.

The President remarked that this was but an outline sketch of the journey; doubtless a much more detailed account would be shortly received.

Lieut. Chimmo, R.N., F.R.G.S., said no person could take a greater interest in the paper than himself, as he was sent out in the 'Torch' to leave supplies for Mr. Gregory and his party. But there was one portion of it which he could not allow to pass unnoticed, as it appeared to reflect on the arrangements made by him for the search of that party. Mr. Gregory stated that although he found marks and indications of a party having been in the Albert River, yet he could not ascertain that they came there in search of him. Mr. Gregory's visit must have been rather short, or he would have discovered some of the numerous indications that were left for his guidance. One whole evening—and the evenings were rather long in Australia—two boats' crews were employed cutting marks on trees, hanging up bottles with notices in them on different branches, and one man climbed a cocoanut-tree, the only cocoanut-tree on the river, 63 feet high, and hung a bottle in a conspicuous place. He did not regret that Mr. Gregory's visit was short, because, as it was about the change of the monsoon, his people might have suffered from the serious effects of the climate at that period, on the uninviting and barren shores of Northern Australia.

Mr. Robert Wood said he should be exceedingly sorry to say one word that could discourage the interesting endeavour to search for the remains of Dr. Leichhardt. But the accidental circumstance of the Doctor having paid him a short visit at his house at Belmaine, near Sydney, a very few days before starting on the expedition, had put him in possession of Dr. Leichhardt's intentions as to the *route* he proposed to follow. That route differed materially from the one suggested in Mr. Sidney's paper, and he, therefore, thought it his duty to lay it before the Society. He conceived it necessary to do so, because he believed that Dr. Leichhardt would under all circumstances follow out this route. He assigned as a special reason for doing so, that it would probably bring him to a tangent with the route formerly taken by Captain Sturt from the southern coast, and he expected to intersect that line at almost right angles by crossing from the east to the west of the continent of Australia. He proposed to start from Moreton Bay, and to diverge slightly to the northwards in penetrating the interior; then, after reaching Sturt's line, to go on to Perth on the west coast. He was accompanied by Mr. Lynd, whose name had been given to one of the rivers on the east coast.

The PRESIDENT asked Mr. Wood whether it was his opinion that, in adventuring westward, Dr. Leichhardt had got lost in some of the saline deserts in the interior?

MR. WOOD was sorry to say that this was his opinion.

MR. HAUG said that the deep interest which he took in the fate of Dr. Leichhardt gave rise to the project which he had the honour to lay before the Council three years ago. If Leichhardt had crossed the track of Sturt, or even advanced more into the interior, it might have been supposed that Mr. Gregory would have come upon some indications of the direction taken by Dr. Leichhardt. Still Mr. Gregory had not mentioned having heard from the natives anything about Dr. Leichhardt. All who cherished geographical enterprise would feel indebted to Mr. Sidney for the plan he had proposed, and he hoped the Council would not be wanting in starting a new expedition for the purpose of discovering something more of the fate of Dr. Leichhardt.

MR. P. L. SIMMONDS observed that he had, during some years past, paid attention to this subject. He well remembered that, in his first expedition, Dr. Leichhardt was given up; and, as in the case of African travellers, he was a little sceptical about the fate of Leichhardt, until more satisfactory proof of his fate had been obtained. Supposing that he did make his way to the westward in the direction he intended, circumstances might have occurred to cause him to diverge in some degree to the northward or the southward of the proposed line of route. Travellers could not always adhere to the plan they laid down for themselves. With regard to the interior of Australia, the means of support were not so hopeless as was supposed, for it was well-known that the aborigines lived on a variety of things produced by the soil. He was glad to see the subject revived, and he could only hope that the Society would not let it drop, without an effort to obtain some definite information as to the fate of the missing party. Taking into consideration the vast extent of Australia, and the slow progress that the party must make, having to find their own sustenance, he did not think the time which had elapsed since the expedition started, should lead to the conclusion that Leichhardt was hopelessly lost.

MR. W. J. HAMILTON, F.R.G.S., rose with considerable reluctance, but having taken a very great interest in the progress of Dr. Leichhardt, and believing that it was now almost hopeless to expect any satisfactory result from the exploration proposed, he should wish—although most unwilling to throw cold water upon any expedition likely to prove useful—before the Society was led away by the hopeful expectations thrown out by Mr. Sidney, to ask a few questions. In the first place, it had always been understood that Dr. Leichhardt would proceed almost in a due west direction from the parallel of Sydney or Moreton Bay. With regard to that point he should like to ask Mr. Sidney where was the point at which the ship was to meet the expedition after one year had elapsed? Next, he wished to know, how it was proposed that the parties composing the expedition, should carry provisions for themselves and fodder for the horses through those arid districts, which constituted the principal feature of the interior? The nature of the country had been sufficiently ascertained to lead to the conviction that, without carrying a very large supply of provisions, both for the men and for the beasts, which would form the staple of this expedition, it would be impossible to penetrate to any great distance through the sterile regions of Central Australia.

MR. SIDNEY said that they had just learned from Lieut. Chimmo, that Mr. Gregory had even missed the traces of the 'Torch' party, which preceded him a very short time. Therefore, they had very fair reason to conclude that many traces of Leichhardt would also have escaped him, and that up to the present time, no search had been made at all. With respect to the manner in which the proposed expedition should be conducted, he observed that the plan of proceeding was drawn up by gentlemen practically acquainted with the subject, and who were as great authorities on Australian travel, as Kit Carson and Col. Fremont were on travelling in America. As to the point on the coast where the ship ought to meet the party sent in search, it should be selected by the leader of the party. It would be better to leave that to him than to settle it here at home. The blacks, it was well known, could live upon lizards and grubs, and with a pound of flour to each man per day, there would be no difficulty with regard to the support of the party.

MR. GALTON, F.R.G.S.—"Having devoted considerable attention to what I have termed the 'Art of Travel,' I must beg to express my opinion that the arrangements which I have heard proposed this night for an expedition in search of Dr. Leichhardt, and towards the equipment of which the English public is asked to subscribe, do not appear to me to offer any probability of success. I am very willing to grant that the gentlemen who have planned this expedition, may personally be well-qualified explorers, but I cannot think otherwise than that they are far too sanguine and enthusiastic in their estimate of what might be accomplished by the means they propose. In the first instance, they expect to reach in six months a distance which they assume Dr. Leichhardt to have required three years to accomplish. This I think very unlikely. Again, it is proposed to take a caravan of some sixty horses—a number that I believe is very difficult for 15 men to manage efficiently in a broken country. Their estimate, moreover, only professes to allow 1 lb. of solid food (flour) per diem for each man. Human life cannot subsist on 1 lb. of flour per day. Those who are interested in this subject may consult with great advantage the excellent paper by Dr. Christison in the Appendix to the Report of the Crimean Commissioners, where questions of diet are thoroughly gone into and established on a positive basis. By the facts adduced in that paper, it will be seen that at least double the weight of solid food, that it is here proposed to carry, is absolutely essential. Lastly, it is assumed that the track of Dr. Leichhardt still remains so clearly defined, that the proposed party could follow it straight onwards without difficulty or delay. Such might possibly be the case in certain woodland districts, but across most sandy tracts, it is clear that the clue would be entirely broken, and that a pursuing party must, under these circumstances, be prepared to devote considerable time towards recovering it. They would be like hounds slowly hunting on a cold scent, and coming perpetually to fault, while, farther, it must be recollected, that questions of water and of fodder do not admit of prolonged and careful search in desert districts. For these reasons alone, and without entering deeper into the subject, it seems to me, as I said before, that the means proposed for following up the tracks of Dr. Leichhardt are entirely incommensurate with the difficulties of the case."

MR. SIDNEY said that the black men of the party would pick up food by the way, and partly support themselves.

MR. GALTON.—They would not be able to pick up much sustenance, as they travelled quickly on through a desert.

MR. T. SAUNDERS, in reply to Lieut. Chimmo's assertion, that North Australia was arid, barren, and unfit for human habitation, quoted the opinions of Flinders, Stokes, and Leichhardt, to show that it was just the reverse. He then reviewed at some length the course of Mr. Gregory's expedition, and maintained that, with reference to the Gulf of Carpentaria, and the south-eastern affluents of the Victoria River, he had failed in the objects entrusted to him. The only thing he had accomplished was to determine the north-west limits of the great desert, as Austin had the south-west limits, and Sturt had the south-east. Mr. Gregory might have waited on the Gulf for the arrival of his tender with supplies, and have employed his time in tracing some of the numerous rivers falling into it, from their mouths to their sources in the interior.

The PRESIDENT, in bringing the discussion to a close, said that Mr. Gregory appeared to have followed the instructions given to him by that most accomplished traveller, Captain Sturt. He had proceeded in two directions to ascertain whether the interior of the country was a saline desert or not. Having satisfied himself on that subject in two or three excursions to the southward, he proceeded to the northward, to mark, as far as it was possible, the nature of the affluents that fell into the Gulf of Carpentaria. Whether he had sufficiently examined them, it was not for the Society to judge until they had received the details of his journey. They all knew it was one of the most remarkable journeys ever performed in that great continent.

With respect to Dr. Leichhardt, he could not entertain hopes of his being found alive, because from all that could be learned, the interior was one vast saline desert; it was only the coast region that was capable of sustaining human life; and if Dr. Leichhardt went to the westward, he must have gone into the saline desert, and probably perished there with all his party.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1857.

Eleventh Meeting, April 27th, 1857.

Sir RODERICK I. MURCHISON, President, in the Chair.

Elections.—*Major-General A. Alexander; Dr. Risdon Bennett; Major-General J. R. Craufurd; Rev. C. E. Ruck Keene; Sir George Simpson, Governor-in-Chief Rupert Land; the Rev. R. C. Trench, Dean of Westminster; and G. W. Allan; A. Asher Goldsmid; H. R. Grellet; Charles C. Hill; Richard Hoper; Austen H. Layard*, D.C.L.; *G. A. Lloyd; Andrew A. Paton; Edward Purcell*, LL.D.; *Thomas Vardon (Librarian of the House of Commons); and Charles Verrey, Esqrs., were elected Fellows.*

Donations.—The donations to the Library since the former meeting were very numerous, among which the following more important ones were mentioned:—184 sheets of the Ordnance Survey, completing the county of Linlithgow; 21 sheets of the Indian Atlas; 194 charts and other geographical works, presented by the Hon. the East India Company; 5 additional maps of the Atlas of Bavaria, presented by the Surveyor-General's department in Bavaria; Reuss and Browne's Map of the Subdivision in and about Sydney and its Environs, in 4 sheets, presented by the authors; map of the United States, British and Central America, by Professor A. D. Rogers, of the United States, and A. Keith Johnston, F.R.G.S.; Nos. 9, 10, and 11 of the Royal Illustrated Atlas, by Messrs. Fullarton and Co., of Edinburgh; manuscript map of South-Eastern Africa, showing the Orange River Sovereignty, &c., by Mr. R. Moffatt, presented through Dr. Livingston; Memoirs of the Geological Survey of India, presented through Professor Oldham; Projections of Two-thirds of a Sphere, by Colonel James, R.E.; Dr. Armstrong's Discovery of the North-West Passage; maps of the Indian Archipelago and Chile, &c., by J. Bartholomew, Jun., F.R.G.S.; &c. &c.

Announcements.—The President announced that the subscription list in aid of the expedition in search of the Franklin relics, and towards which 800*l.* had already been subscribed, would be shortly advertised. The Eighth Number of the Proceedings of the Society was laid on the table.

The Chairman then drew the attention of the meeting to the Chinese maps, presented by Consul Parkes, F.R.G.S.

The papers read were:—

1. *Memoir on the Neighbourhood of Canton and Hongkong, and the East Coast of China.* By Sir JOHN FRANCIS DAVIS, Bart., K.C.B., F.R.G.S.

As the seat of the late operations, and the most probable theatre of the future ones, in the existing dispute with China, it may perhaps be of some interest to take a general view of the neighbourhood of Canton and Hongkong, including the whole of the river as far up as the provincial capital of Kuang-tung province. All our troubles since the war (at least, all that have not admitted of a satisfactory arrangement) have been at Canton. Circumstances, which cannot be fully detailed here, have tended to promote both the ill-feeling and the arrogance of the Cantonese. At most of the new ports to the northward the power and the moderation of the British were equally demonstrated during the war, until the growing good feeling of the native population towards their invaders became one of the omens, at least, which induced the Imperial Government to hasten an accommodation with us. Canton, on the other hand, has escaped chastisement, and (as might have been foreseen) attributed this merciful forbearance to wrong motives;—a mistake which the experience of the North has not corrected, because the immense distances and the imperfect means of communicating knowledge (so inferior to our own in Europe) keep the different portions of that empire very much in the dark respecting each other.

A better proof of this almost incurable ignorance could not be adduced, than the account of the English received by M. Huc from a Tartar near Peking, one of a body who had been stationed at Tien-tsin, to oppose us in case we approached the capital. To the question, "Vous êtes-vous battus? avez-vous vu l'ennemi?" he replied, "'Non, il n'a pas osé paraître.' Les Chinois nous répétaient partout que nous marchions à une mort certaine et inutile. 'Que ferez-vous,' nous disaient-ils, 'contre des monstres marins? Ils vivent dans l'eau comme des poissons; quand on s'y attend le moins, ils paraissent à la surface, et lancent des "*si-koua*"* enflammés. Aussitôt qu'on bande l'arc pour leur envoyer des flèches, ils se replongent dans l'eau comme des grenouilles.'"

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* Their name for bombshells.

It seems at once good policy as regards the Cantonese, and mere justice and humanity towards the better-disposed populations towards the north-east, that, if a lesson is to be administered, it should be administered in the right quarter. Topical evils require topical remedies: and if we were once more to leave Canton to itself (as we have done before), the question would again be asked, which was so often asked then,—"Why did you not address yourselves to those who had offended you, and were prepared to resist you, instead of attacking us?" At Canton, besides, there is nothing at present to lose, for all trade has left it, and all the foreign quarter is in ruins. The complete capture and occupation of the city and the heights behind by our troops, with Hongkong and its harbour, its barracks and its hospitals, for the base of operations, would at once dispel the delusions of the Cantonese, and supply us with a material guarantee and pledge, as long as it was retained, for all that we have to require from the Peking Government. These two points seem to comprise within themselves the objects of the expedition—that is to say, satisfaction for the past and security for the future; and, as the surest way to the second, the first seems indispensable—viz. the capture and occupation of the provincial city.

Apart from some peculiar disadvantages which conspire to render Canton about the worst place for our trade (a trade which was altogether forced there by the policy of the Tartar Government), that city happens to be placed on one of the finest and most commodious navigable rivers in the world. Some account of this river, and of the islands and principal anchorages in its neighbourhood, with the several points of defence, may be interesting at a time when the public prints contain accounts of naval transactions, and of movements from one place to another whose names and localities are to many unknown.

The whole distance between Canton on the N.W., and Hongkong on the S.E., is about 77 nautical miles, of which 45 extend from Hongkong to the forts at Boca Tigris, and the remaining 32 to Canton. Whampoa, the place of anchorage for trading vessels, is about 10 miles below the provincial city, and this is a great drawback, for in China our trade is always most secure under the guns of our vessels, as at Shanghae and Amoy. Until our war there was only one recognised passage between Whampoa and Canton; but the enterprise of her Majesty's ships in 1840 and 1841 discovered a convenient passage to the south, called Blenheim Reach, from that ship of the line having navigated the greater portion of the way. The principal defences of the river are, first, the famous Bogue forts, which mount some hundreds of very large guns, and, to appearance at least, are extremely formidable. But they have been three times taken—in 1841, by Sir Gordon Bremer; in 1847, by the expedition which I took up myself; and again, in 1856, by Sir Michael Seymour. A little higher to the left is a long battery on Tiger Island, to which all ships are obliged to pass very close, on account of the shoals on the left bank of the river. No other defence occurs until the one called the First-bar Battery, on the left bank, erected about the time when Sir Thomas Herbert's light squadron routed the Chinese force in 1841. The principal defences towards Canton are at the point called the Barrier, where the two divided channels of the river unite, and where a barrier of stakes has been long constructed. Here are about six batteries, and the position would be impregnable were it not for the absurd manner in which the forts are built, upon perfectly square plans; so that if you advance on an angle scarcely a gun can be brought to bear. The embrasures, or rather windows, are almost large enough for a lord mayor's coach, and furnished with folding-doors of wood, by way of supplying plenty of splinters for the garrison. I have found no reason to change the explanation which I gave in a work on China, twenty one years ago, of the unimproved condition of the military resources of the country. First, that pride and conceit which is a bar to all improvement in the arts, and, among the rest, the art of war. Secondly, that jealousy of the Chinese population which has prevented the Tartar Government from making of it such efficient troops as it might; for during the war we always found the greatest possible difference between the Tartars and Chinese. Thirdly, that overwhelming superiority which the empire has possessed over the petty and barbarous states on its frontiers, and which has precluded any serious calls on its exertions.

The remaining defences occur on reaching Canton. First, the French Folly (the origin of the name altogether unknown), which *was* on the east of the city, but which has been blown up and demolished by Sir Michael Seymour; the Dutch Folly, on an island in the river, which was lately occupied by our force, and from which the Viceroy's palace was bombarded and destroyed; a thing opposite the Foreign Quarter, very like a goose-pie, but named the Red Fort; and what is called the Shameen Fort, a little above the Foreign Quarter. Since our discovery and navigation of Blenheim Reach, a fort or two have been there erected. In the continuation of the same passage towards Canton is the Macao or Teatotum Fort on an island (so called, perhaps, from its square or octagonal sides), and the Bird's-nest Battery, a little higher up on the left bank. Sir Michael Seymour, in temporarily leaving the Foreign Garden, as a less strong position, has very wisely occupied the Macao Fort, which is easily defended by co-operation with his ships. Having determined on keeping the river open pending the arrival of reinforcements, the admiral has placed his ships within signal distance of each other all down the river, so as to co-operate in case of necessity, and prevent the channel being blocked up by the Chinese. The difficulties of this plan are considerably increased by the numerous creeks and side-channels on each bank of the river, where the flat-bottomed junks can lurk and send out fire-rafts and other annoyances upon our ships, without the possibility of being followed and cut off in return. The fire-rafts, however, are not so dangerous as might be apprehended, since they can be taken in tow by rowboats, and driven on shore to burn at their leisure. The species of vessel most wanted by the last accounts were gunboats of light draft to follow up the junks into these creeks and destroy them; and, with the assistance of such, no doubt a good account will be given of the enemy. Almost every Chinese afloat in the neighbourhood of Canton is a pirate, whenever he can turn his hand that way; and perhaps one of the best results of the proposed naval expedition would be the extinction of piracy about Hongkong and the coast (interfering so seriously as it does with our trade) by disarming, and, if necessary, destroying, every armed junk fallen in with. The excuse for carrying arms is "self-defence against pirates;" but they are, in fact, all pirates in turn, and if all are disarmed equally this pretence will be annihilated.

In the mean while, both the internal and the external troubles of China seem to have conspired to favour the progress of our own colony of Hongkong. More than thirty years ago I remember sailing round it in a yacht, and occasionally landing to shoot, when it was nearly uninhabited, and now it contains 70,000 Chinese inhabitants, with occasionally as many as a hundred European ships in the harbour. This harbour is one of the finest in the world, and, according to the testimony of Admiral Cécille, of the French navy, superior to that of Rio Janeiro, which, I believe, has ranked as the first. All these circumstances combined, together with the accommodation for troops on shore, must tend to give the present expedition an immense advantage over the first one. The unhealthiness of Hongkong was experienced on the first occupation (I believe a very frequent occurrence), and this was much aggravated by the effects of Chinese spirits on our troops; for while the prisoners in gaol were quite healthy (without the luxuries which prisoners in gaol enjoy in this country), the soldiers in barracks, who had access to liquor, were dying at the rate of 10 in a week. I was rejoiced to find, by 'The Times,' that his Royal Highness the Commander-in-Chief had himself addressed very seriously on this subject a corps of artillery at Woolwich previous to their embarkation. There is not only the inherent mischief of these unwholesome Chinese spirits (bad enough in themselves), but the additional danger of their being poisoned.

Quitting Hongkong, we may now proceed along the coast to the new ports in succession, where it is to be hoped the peacefully trading inhabitants (so different from the Cantonese) may not be disturbed by war, as most of them had plenty of it on the former occasion. If they can only experience our moderation for a time, they may perhaps at last get rid of the idea which in China attaches everywhere to an Englishman, viz. that of a *bipes implumis* who goes about surveying and map-making, with a view to ultimate occupation.

Leaving Hongkong, we proceed about 260 miles N.E. to Amoy, the first of the four new ports, and the first which felt the force of an armament in 1841. Here an immense range of stone-wall had been erected and mounted with cannon for our reception; but though the lower-deck guns of the Liners had little effect on it, the place was easily taken by escalade on the left flank of the wall. The harbour of Amoy and approach to it are extremely commodious for trade, which can be carried on close to the shipping. The small island of Koolangsoo forms the south of the harbour, and was retained by us, together with Chusan, as a guarantee for the payment of the indemnity; but on account of its extreme insignificance and the unhealthiness of our troops there, I was authorized to give it up to the Chinese government, according to instructions from home, before the expiration of the full period. Here are some curious vestiges of our former intercourse with China, in the shape of tombstones in an extraordinary state of preservation. The chief objection to Amoy as a place of commerce is the small trading capital of the native merchants. They have but few exports; and the imports which find most favour there are not our manufactures, but the productions of the Malay archipelago, which go under the name of Straits produce. The people of this province of Fokien are the most maritime of the Chinese population. Their voyages have long taken them to the islands of the above-named archipelago, where they need seldom be out of sight of land, and where they have familiarized themselves to the commerce of that region.

About 150 geographical miles to the north of Amoy lies Foo-chow-foo, the next of the new ports. This place escaped a visitation from the expedition in 1841, and would have been all the better for some experience of our power; for in consequence of those obstacles to the spread of intelligence already adverted to, the people retain some of their original ignorance regarding foreigners, and have besides much of the turbulence and ferocity of character attaching to their neighbours the Cantonese; to whom, however, they bear a deadly dislike, and with whom they have a perpetual feud. It was here that an attempt was made to persuade me that our Consul at Foo-chow-foo must be excluded from the interior of the city, as he was at Canton; but I treated it as a mere pretence—which it really was—and had the satisfaction of establishing him in a good position within the city, soon after the opening of the port. This place was not promising at first as a port of trade. The river, which is picturesque and beautiful as a natural object (being rapid and rocky like the Rhine, but much more shallow), is on that account of difficult and dangerous navigation, and the anchorage besides is 10 miles below the city. The natural advantages, however, as a mart for black teas (being so near the place of their production), have conquered other disadvantages, and the exports of tea from Foo-chow-foo have of late years become considerable.

Ningpo-foo, the next of the new ports, lies as far as 270 miles to the north of this, and afforded winter-quarters to our invading force in 1841. The union of power and clemency, which the people of this place experienced from us at that time, has been followed by the best effects, and at no spot have foreigners enjoyed more comfort and liberty in their movements than here. As a place of trade, however, it has failed. This must be attributed to the near vicinity of Shanghae, by far the best port of all, which by its superior advantages and attractions has drawn away nearly all commerce from Ningpo. The embroidered silks of Ningpo, and the ingenious works in inlaid wood, constitute the principal native productions.

Opposite to the river's mouth, at the distance of some 50 miles, lies the island of Chusan, with its chief town Tinghae. It is well known that we had possession of this fine island for about five years in all, during four of which it was retained as a security for the payment of the war indemnity of 21,000,000 dollars. It was my fate to resign it with some regret, on the payment of the last instalment in 1846; and as this Society has done me the honour to place a Memoir and Map of the island in its 23rd Volume, there is the less need to say anything more concerning it on the present occasion. Chapoo, a port pertaining to the famous city of Hang-chow-foo, was visited by our war-expedition; but the tides and eddies of the dangerous estuary prevented the squadron going up to the town.

We lastly come to the very important and flourishing port of

Shanghae, something more than 100 miles to the north of Ningpo, and as much as 800 from Hongkong. Here it was that the Tartar government took serious alarm at the progress of our armament in 1842, after it had issued from its winter-quarters at Ningpo. An immense line of stone batteries had been constructed at Woosung, the mouth of the Shanghae river, but these were carried in about two hours, and the force found Shanghae itself not only deserted but a prey to hosts of Chinese plunderers. The natives showed so little patriotism here that they very merrily lent their aid to drag our guns against the town, the mandarins being all dispersed. In fact, the conduct of our force in winter-quarters at Ningpo had diffused such an opinion of our invincibility in the field, as well as of our clemency and good faith, that the people showed not the slightest objection to our approach, and this (as already observed) was one of those omens which opened the eyes of the Tartar government, and induced them to hurry the conclusion of a peace. The Treaty for this was shortly afterwards signed on board the Cornwallis flag-ship, opposite that very gate of Nanking where I myself in 1806 saw an act of incivility attempted to our Ambassador, the late Lord Amherst, in shutting the doors against him; though on a strong remonstrance being made the rudeness was atoned for, and the gates re-opened. Shanghae, as a place of trade, has more than answered expectation, having far outstripped Canton during even the few years that have intervened since 1842, and notwithstanding the troubles that ensued there from its capture by the rebels about four years ago. Circumstances here have contributed to make our condition very different from what it has been at Canton, and, instead of obtaining *less* than our Treaty rights, we have almost obtained *more*. In lieu of a mere *Consulate*, we obtained almost a *Settlement* of above a hundred acres on the river, which the neighbourhood of the rebels afterwards obliged us to fortify. Whenever the necessity for this ceases, the fortification should cease, if it were only to convince the Chinese that we do not want their territory, but only their commerce and friendly intercourse. It would not be right to conclude these observations without adverting to that splendid river, the Yang-tse-keang, on which Nanking stands, and which seems to have been specially adapted by nature to steam navigation. Lord Colchester, an ex-president of this Society, can bear me witness to its magnificent character, for we were travellers in the same boat along a great portion of its course, as far inland as the Poyang Lake. Pope says of the Thames,

> 'Search not its bottom, but survey its shore.'

Lord Colchester did both; for he took soundings from Nanking to the Poyang Lake, and with that and the compass constructed a chart which, if it is not already, ought to be, in the archives of the Society. From Nanking downwards an excellent survey has been made by Captain Collinson, R.N.

The President returned the thanks of the Society to Sir John Davis for his most instructive communication. They could not make a better comparison between the Chinese and ourselves, than by comparing the map of that country drawn by Mr. Arrowsmith, with the remarkable Chinese map presented to the Society by Consul Parkes. The subject of China could only be well discussed by those who were acquainted with the country; and he was glad to see present Mr. J. Crawfurd, and also that distinguished General, Sir Colin Campbell, who could illustrate how the Canton forts might easily be taken.

Mr. J. Crawfurd, F.R.G.S.—It was not very easy to speak with any effect after the best-informed man in Europe, and one, he believed, better informed than the Chinese themselves, respecting the empire of China. He had himself never gone farther than Cochin-China; but he had had a great deal of intercourse with the Chinese. He had lived among them, and had some authority over them, for twelve or fourteen years; and, on the whole, he was pretty well acquainted with them. He knew the emigrants tolerably well. It was well known that China was a populous country, and a country of vast extent; but mistakes prevailed respecting its population. It was said to be the most populous country in the world. This was not the case, as it was not even so densely peopled as Great Britain and Ireland. The whole area of China was 1,300,000 miles—about twelve times the extent of Great Britain. Its population was supposed to be 360,000,000, according to the census taken forty-five years ago. In Great Britain we had 300 inhabitants to the square mile, the Chinese 277. The population was most unequally distributed. In some provinces—the province of Yun-nan, for example—there were not above 50 inhabitants to the square mile, and that province is about the extent of Great Britain and Ireland put together. Then, there were some provinces which contained 600 or 700 inhabitants to the square mile, as in Che-kiang, a great silk country. The first subject he would bring under notice was the emigration from China. When Europeans were first acquainted with China 350 years ago, there were no emigrants; but the protection afforded by European governments, especially by our own, had encouraged the Chinese to emigrate and to settle in the neighbouring islands. The emigrants were all of the working classes, and they were all adult males. The women never emigrated, and the consequence was that the men were a little turbulent and ill-conducted. He estimated the number of Chinese emigrants in the eastern islands, including the Philippines, at about 350,000: there was, besides, a considerable number in Cochin-China, and a far greater number in Siam, which contained, he believed, not less than 1,000,000. All that was most valuable in Siam depended, indeed, upon the industry of the Chinese. The Chinese settlers generally were an exceedingly industrious, well-doing people, and he had never himself experienced the least inconvenience from misconduct on their part. When he was at Singapore, at the head of the civil administration, fears were at one time entertained of the Malays, and the chiefs of the Chinese came, and, in the handsomest manner possible, offered their assistance to put down the expected disturbance. He mentioned this, because it was said the Chinese were conspiring against us throughout the whole of our insular possessions. He believed there was no foundation whatever for that allegation, for he had never known them to be turbulent or disorderly. In our settlements they were upon the same footing as British subjects. They sat on petty juries, on grand juries, and some two or three of them were justices of the peace in our principal settlements; they were shipowners, and they traded far and wide—to the Cape of Good Hope, to the Mauritius, and to every port in India. There were many wealthy people among them, and he was certain a people in their condition would not be disposed to insurrection; they knew, moreover, that they were better off under our government than any other. Our trade with China was a most important subject. The exports and imports, including the trade between India and China, could not be less than 15,000,000*l.* each, which approached the largest branch of our foreign commerce—the trade with the United States. Complaints had been made of the quantity of silver sent out of this country to the East. The cause was obvious enough. We received an immense supply of productions from China, and, of course, were obliged to pay for it in silver. With respect to the opium trade, he approved of it entirely. He thought the use of opium as innocuous as the use of any description of wine, and a good deal more so than that of brandy or other ardent spirit. He had the authority of Sir Benjamin Brodie for this. That eminent medical authority said that opium soothed the nervous system, while brandy and all alcoholic spirits irritated it exceedingly. Both were, of course, liable to abuse; but he conscientiously believed that opium was much more rarely abused than ardent spirits. Some people fancied that the Malays took opium for the express purpose of running a-muck. Now, when the Malays and Chinese took opium, they smoked it in the form of a little ball, not much larger than a swan-shot; half a dozen whiffs sent them fast asleep, and when asleep, they dreamed they were in a Mahommedan paradise making love to houris. That was surely not the condition for a man to run a-muck in. The Indian government received about 3,000,000*l.* a-year from the opium trade—about one-seventh of their entire revenue. It was not our business to put a stop to the trade. So long as the traffic was prohibited by the Chinese, smuggling must take place; and that could only be put a stop to by the Chinese legalising the traffic and imposing a moderate duty upon the article. It was argued that it was the duty of the Indian government to suppress the growth of the poppy, in order to favour an absurd and ridiculous prejudice on the part of the Chinese. The 'Edinburgh Review,' in its last number, proposed that we should enter into a treaty with the Chinese, and bind ourselves to put an end "progressively" to the growth of the poppy in India for the production of opium for exportation. We could not do that without "progressively" putting an end at the same time to our Indian empire; for, without the 3,000,000*l.* revenue derived from opium, it would be impossible to carry on the Indian government. There were other articles of import into China of some importance. The raw cotton of India was sent in considerable quantities to China; and that was one reason why (the gentlemen of Manchester should understand) it did not come to England. The cotton-wool imported into China was of the value of 500,000*l.* sterling, whereas the opium taken annually was of the value of 5,000,000*l.* To ask us to put a stop to the growth of the poppy, would be just as reasonable as to ask the French to put an end to the growth of the vine, because spirits and wine were sometimes productive of drunkenness in this country. Among other imports into China were the swallows' nests, a gelatinous substance, almost tasteless, but in much repute for making soup. There was another article of commerce, the sea-cucumber, of which specimens might be seen in the Gardens of the Zoological Society. Several thousand tons were imported into China annually. The Malays proceeded as far as the Gulf of Carpentaria in search of this article, and there Captain Flinders found them fifty years ago. Another article of import he might mention, was camphor, not the common camphor, but concrete camphor, obtained from a certain tree; it was valued for its supposed restorative properties, as are the other articles just named. With respect to the exports of China, he would only touch upon two—tea and raw silk. It was not until the middle of the seventeenth century that the use of tea was known to Europeans. The first tea introduced into England was a packet of 2 lbs. 2 ozs., sent as a present to Charles II. by the East India Company in 1664. It was not obtained in China, but at Bantam; it was what is now called junk tea, and execrable stuff it must have been. Forty-six years afterwards we consumed about 1,000,000 lbs. of tea. In the first year of the next century our consumption of tea, notwithstanding monopoly, taxes, and duties, had risen to 20,000,000 lbs. In 1833, before the monopoly of the China trade was overthrown, it was 30,000,000 lbs., and last year our consumption was 63,000,000 lbs. We paid for this tea about 5,000,000*l.*, exclusive of the duty, and the duty amounted to about the same sum; so that our tea cost us 10,000,000*l.* prime cost, exclusive of retail profit. He had no doubt the consumption would continue to increase. A few words respecting the raw silk. Down to the years 1833 and 1834, the East India Company asserted that it was impossible to extend the production of raw silk. The monopoly was overthrown, and the importation of raw silk from China had risen from 2000 bales in that year to 20,000 bales in the year before last. This year, owing to the failure of the silk crop in France and Italy, the importation of Chinese silk will be 70,000 bales. Having thus spoken of the commerce of China, he would say a word about the war. The only point on which he begged to differ from Sir John Davis was with respect to the mode of carrying it on. Sir John Davis seemed to think that the attack and capture of Canton would be all-sufficient. He did not think so. It was not found to be so in the previous war.

Sir John Davis.—We never captured it.

Mr. Crawfurd.—We did pretty much the same; we inflicted a heavy fine. Being 1200 miles from the seat of the Chinese government, the capture of Canton would not be sufficient. He thought we must do what we did before—cut off the communication between the northern provinces, containing the capital, and the southern, the chief sources of the supply of food and revenue.

Mr. Ed. Divett, m.p., f.r.g.s., wished to ask a question respecting a subject of great interest. Sir John Davis had spoken of the piracy which existed in the Chinese waters. He should be very glad to know whether the same sort of piracy was practised on the other parts of the Chinese seaboard?

Sir John Davis.—The piracy which prevailed on the coast of Canton, and of the neighbouring province, Fokien, was very much the result of the physical configuration of the coast, which was that of an archipelago of small islands, abounding in harbours and indentations, affording lurking-places for predatory vessels. The very extensive system of fishing which prevailed on such a coast created those maritime habits so favourable to the life and profession of a pirate. They were, in fact, fishermen to-day and pirates to-morrow. The evil did not extend beyond the province of Fokien, to the same degree at least. It was absolutely necessary for the safety of our commerce, and for that of the Chinese *themselves*, that it should be put down in the most summary manner possible, and there could be little scruple in acting thus against those who were in fact the enemies of the human race, and the worst obstacles to commerce. With the possession of the light draft gunboats which we were about to send out, there never was such an opportunity for getting rid of them—disarming all, without exception, if not destroying them. He would now advert to the observation of Mr. Crawfurd on the subject of resorting to the mouth of the Grand Canal and the neighbourhood of Nanking. He should be the last man to say a word against it, because before the last war he had recommended in distinct terms to the Duke of Wellington himself the adoption of the plan, which plan was adopted with complete success. But at the present time the ground was pre-occupied by the insurgents. They had, by possessing Nanking and the canal, cut off the communication with Peking that way, as well as we could, and by going there we should only come in collision with those to whom we have always professed perfect neutrality,—we must become either their allies or enemies. The communication with Peking had been at one time, if it was not now, as effectually cut off as if we were to go to the neighbourhood of Nanking. With respect to the effect on Peking of the capture of Canton, we had in reality never yet occupied the place. We had threatened it, but we allowed it to be ransomed by the Hong merchants, instead of the inhabitants themselves, and they had laughed at us ever since, as well they might. If we were fairly to *occupy* Canton, quarter our troops upon it, and make the inhabitants pay all that our merchants have lost, they would never forget it, and there would be an end of their "braves," as they called their vagabond militia. The people did not pay a fraction of the last ransom; it was the Hong merchants who paid it. Canton was a provincial capital, the capital of *two* provinces; and if we were fairly in possession and our troops quartered there, it would make the Imperial Court listen to our terms to get rid of us.* With regard to opium, he quite agreed with Mr. Crawfurd as to the physical effects of the drug. It was infinitely less deleterious than the spirits which we license and encourage in England, and the consumption of which particularly disgraces the English *Sundays*, from the want of more inviting recreations for the lower orders. It seemed to himself quite superfluous attempting to put an end to the traffic, for since the war and the treaty of Nanking the Chinese had utterly abandoned all attempts to stop its sale and consumption. Several of our consuls had officially reported to him that they had seen it carried about in broad day, and consumed in regularly licensed houses. It would be the extreme of impertinence on our part to interfere with an article which the Chinese voluntarily admitted; we had no more right to interfere than the Chinese had to interfere with our consumption of both opium and (what was worse) spirits. The emigration alluded to by Mr. Crawfurd was a beneficial emigration, and one which ought to be encouraged. But there was another sort of emigration which was a disgrace to this country, and which ought to be at once stopped. This was the exportation to Cuba of coolies, who of course became slaves. He first got a glimpse of it when he was in China, and the instructions he issued to our consuls on the occasion prevented its spread at that time. Since then, however, the evil had extended, and the horrors endured by the coolies on board were equal to those of the middle passage between Africa and the West, with an enormously lengthened voyage. He trusted it would speedily be put a stop to. In vain would Wilberforce and Clarkson have exerted their energies in the abolition of the slave-trade, if it was to be revived in this new shape. This was the *real* grievance of China against us, and not the opium trade, which their own toleration of it had taken out of our hands.

The EARL ALBEMARLE, F.R.G.S.—Do I understand that the rebels are in possession of the Imperial Canal?

SIR JOHN DAVIS.—They are, or have been, in possession of the mouth of the canal—exactly the neighbourhood where we dictated peace. Chin-kiang-foo is the last place we took, and the city which commands the entrance of the canal northwards. The rebels are, or were until very lately, in possession of Chin-kiang-foo.

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* Lieut.-Gen. Sir Colin Campbell received these very remarkable observations in a note some years ago from the late Consul Thom, and allows their publication:—"Having once made the demand, we can hardly withdraw from it without confirming the Chinese in the impression that we are *afraid* of the Canton people. This impression *has* gone abroad over the empire, and a most fatal and unhappy impression it is; and this same impression may very likely cause seas of blood at some future day. In itself, the opening of the gates of Canton is (to individuals) neither here nor there; but being made the touchstone of whether we fear the Canton people or not, this gives it *immense importance.*" It is quite clear that Canton must be opened *vi et armis*; all other means would fail, either immediately or ultimately, on account of the "impression" which the Consul very truly and wisely commented on.—J. F. D.

Sir Colin Campbell rose to say that Mr. Bowring, a young friend of his, son of Sir John Bowring, mentioned to him, a morning or two ago, that, within the last two years, two vessels had been sent up to Nanking by his father to ascertain what the insurgents were about, their numbers, and the manner in which they were occupying the country. That object was completely obtained, for he found the rebels at Nanking, but they had not come down so far as Chin-kiang-foo.

Sir John Davis.—Mr. Meadows, in 1853, saw the rebels there, and conferred with them.

Sir C. Campbell.—They were not in possession of Chin-kiang-foo, according to Mr. Bowring, when he was there; and without actual possession of that point you do not command the canal.

The Earl Albemarle.—It is the point of junction.

Sir C. Campbell.—It is. He remembered, when he went up there in command of a regiment, under Lord Saltoun, they were placed outside the town. One of the officers found a house where there was a number of papers, and brought the bundle to him as a curiosity; and it turned out to be a despatch from the officer who commanded the Chinese troops. It was translated by Mr. Thom, and described this officer's movements. It was addressed to the Emperor, and it mentioned his route, his march downwards, in obedience to the orders of the war department there, and stated that, instead of carrying out the farther orders of his Majesty, he had stopped at this place, which he called "the very throat between the north and south." He described that point, Chin-kiang-foo, as the "throat." And the English were at that throat.

Sir J. Davis.—Mr. Meadows, who was despatched by the British Plenipotentiary to communicate with the rebels, actually had his audience at Chin-kiang-foo with the leaders, and describes it in his book. Possibly they had abandoned the point since.

Sir C. Campbell.—It appeared strange that they should be in force at Nanking, and not in possession of Chin-kiang-foo.

2. *North Australian Expedition.*

The following letter, from the Commander of the expedition to North Australia, was read by the Secretary:—

Burnett District, 2nd December, 1856.

Sir,—I have the honour to inform you of the arrival of the North Australian Expedition within the limits of the settled parts of New South Wales.

From the time of landing the horses at Point Pearce in September, 1855, to the 9th May, 1856, the party was employed in preliminary details, and the exploration of the country to the south of the Victoria River, having penetrated the interior deserts to latitude 18° 20′ south, and longitude 127° 30′ east; a detail of which I forwarded by the 'Tom Tough' schooner, viâ Copang, and which doubtless has already come to hand.

The schooner 'Tom Tough' having been seriously damaged in ascending the Victoria River, and a quantity of stores and provisions thereby destroyed, I instructed Mr. Baines to embark that portion of the expedition which was not required to form the land party, and to proceed to Copang for supplies, and thence to the Albert River in the Gulf of Carpentaria, to co-operate with the land expedition.

On the 21st June I left the encampment on the Victoria River, with a party of six persons, viz. Mr. H. Gregory, Mr. Elsey, Dr. Müller, and three men—Dean, Bowman, and Melville.

The arid nature of the country in the interior of Northern Australia compelled us to increase our latitude to 15° S. in order to pass the central parts of Arnheim-land, after which we kept parallel to the coast as far inland as water could be found in the rivers, the greatest distance from the sea not exceeding 100 miles.

Reaching the appointed rendezvous at the Albert River on the 30th August, the schooner had not arrived, but, from some marked trees, it appeared that Her Majesty's Ship 'Torch' had sent a boat up the river a few weeks previous, but it was evident that this visit had no reference to the expedition, as the only marks left consisted of the names of some of the crew, which they had amused themselves by carving on the trees and stumps; and the ashes of their fire.

Under these circumstances, I deemed it not advisable to wait the arrival of the schooner; and having marked trees, and buried instructions for Mr. Baines at a spot which had been previously agreed upon, we left the Albert on the 3rd September, and made some ineffectual attempts to proceed to the south-east, but want of water compelled me to pursue a route parallel to the coast to latitude 17° 20′ S., when the Gilbert River enabled a S.E. course to be again pursued.

Crossing the heads of the Lynd in 18° 40′, we reached the Burdekin on the 16th October. Our route was then along the right bank of that river to the junction of the Suttor River, which was followed up to the Belyando River. Tracing that river to latitude 22°, we then pursued a south-east course to the junction of the Comet and Mackenzie Rivers, and from thence to the Dawson brought us to Messrs. Connor and Pitt's station on the 22nd November.

I am now on my way to Brisbane, where I purpose to leave the horses until arrangements can be made for their disposal, and proceed direct to Sydney.

(Signed) A. C. GREGORY,

Commander N. A. Expedition.

The President said he held in his hand a letter from this distinguished explorer himself. The Society would be delighted to know that the Council had that day awarded one of its Gold Medals to Mr. Gregory, for there was scarcely any exploration in his time which seemed more worthy of the commendation of Geographers, than this exploit of Mr. Gregory. It would be recollected that the expedition was really undertaken by her Majesty's Government at the suggestion of the Geographical Society. In the course of his journey Mr. Gregory penetrated into the interior, in order to ascertain whether it was a vast saline desert, and he tested it on two or three points before he retraced his steps to the Victoria. He came to a valley which, according to his letter, far surpassed the best parts of Western Australia, both in fertility and extent, and also for settlement.

Mr. J. Crawfurd, F.R.G.S., believed Mr. Gregory to be an admirable explorer. He had told the whole truth, and that truth amounted to this—that the country he had explored was totally unfit for European settlements. He could not see how any country lying between 11° and 16° of latitude could be fit for the settlement of the Anglo-Saxon race. The heat must be intense. The grassy plains would fatten bullocks, but who were to eat the bullocks when they were fattened?

The President.—Mr. Gregory does not think so.

Mr. Crawfurd.—Mr. Gregory knew less than he did of countries so near the equator. He was perfectly certain the Anglo-Saxon race would never settle there.

Lieut. Chimmo, F.R.G.S., hoped these recent accounts would convince the public of the worthlessness of the country about the Gulf of Carpentaria.

The President.—That is quite another region, and differs from the valley of the Victoria.

Lieut. Chimmo read an extract or two from Mr. Gregory's communications respecting the climate and soil of the Gulf of Carpentaria, and said it was exceedingly gratifying to him that Mr. Gregory had corroborated the views that he had, on more than one occasion expressed, that the country along the Gulf of Carpentaria was entirely unfit for European occupation.

Mr. Crawfurd observed that the Victoria seemed to be the only considerable stream that existed in that part of Australia. He placed no reliance on the two to three hundred rivers that one gentleman spoke about, as falling into the Gulf of Carpentaria. If they all ran in one channel and formed one river, they would be more serviceable. With regard to the navigability of the Victoria, the schooner only ascended it fifty miles.

Mr. T. Saunders said, that if Mr. Gregory had pursued the same system of investigation, at the Gulf of Carpentaria, which he had pursued on the Victoria, his evidence as to the character of the country about the Gulf would have been worth as much as his evidence respecting the Victoria. But instead of following the streams up to their sources, as he had done with the Victoria, whereby he discovered the nature of the country far into the interior, he, on the Gulf, merely *intersected* the rivers a little distance farther towards the interior, than Leichardt had already done. Had he pursued the courses of the streams, he would probably have found all that Leichardt said he had experienced, with respect to the salubrity of the climate and the fertility of the soil in the Gulf of Carpentaria.

The President, before adjourning the meeting, announced that a communication had been received through the Foreign Office from our consul at Tripoli, stating that he heard no confirmation of the report that Dr. Vogel, the African traveller, had been assassinated. There was no foundation for the statement except the African report, and he, for one, would not believe it before it had been proved.

Twelfth Meeting, May 11th, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

ELECTIONS.—*Major the Hon. Wenman Coke; Lord Dufferin; Command C. Rundel Egerton,* R.N.; *Sir A. H. Elton, Bart.,* M.P.; *Captain M. Nolloth,* R.N.; *Viscount St. Vincent; and J. Bartholomew, jun.; R. Marsden; Arthur Mills; L. R. Reid; John Ross; and J. W. Willcoc* Q.C., *Esqrs., were elected Fellows.*

DONATIONS.—The following were among the donations to th Library and Map-Rooms received since the former meeting:— Chart, framed, showing the intended telegraph communicatio between Newfoundland and Ireland, &c., presented by Mr. Brool ing, F.R.G.S.; Maps of Moldavia and Bessarabia, by Consul Gardne of Jassy; the Transactions of the Lombardo-Veneto Institute Milan; of the Imperial Geological Institute of Vienna; and th Academy of Sciences, Paris; Barth's Travels in Central Africa Lessep's Isthmus of Suez, &c.

EXHIBITIONS.—Among the articles exhibited were Reeder's Pate Mariner's Compass; Sheets of the original drawings of some of th Admiralty Surveys during the past season of Sheephaven, Mulra Donegal, Dingle, and Ventry Harbours, and the Frith of Forth, b Captain Bedford, F.R.G.S., Mr. M'Dougal, and Lieutenant Thoma R.N.; Map of the World, on the Homalographic Projection of th Sphere, by J. Babinet; with Maps of the Crimea and other place engraved on a new principle on stone, by Erhard, and published b E. Bourdin, of Paris.

ANNOUNCEMENTS.—The President informed the Meeting of th departure of the Niger expedition under Dr. Baikie, F.R.G.S.; an stated that the report in circulation of the death of the enterprisin and intrepid African traveller, Mr. C. J. Andersson, was happil without foundation. He was sorry, however, to add that anothe Swedish traveller, Dr. Wahlberg, had perished in an encounter wit an elephant to the northward of Lake Ngami. A letter from M K. L. Sutherland, F.R.G.S., was then read, suggesting the advisabilit of a Naturalist being on board the 'Agamemnon' in sounding th Atlantic and laying down the Telegraph cable. The Chairman ne mentioned that, owing to the inadequacy of the Meeting Room t accommodate the rapidly increasing numbers of Fellows and Visito who—as he was glad to see—were in the habit of attending, Resolution had been passed at the Council that day, that he shoul represent the case to the President of the Council-Board of Educ tion, and request permission to hold their meetings, next session, in the Theatre of the Government School of Mines, in Jermyn-street. The President finally drew the attention of the Society to the approaching Anniversary Meeting, on Monday, the 25th inst., at one o'clock, when the Annual Address would be delivered, and the Gold Medals for the year awarded to Mr. A. C. Gregory, Commander of the North Australian Expedition, and to Lieutenant-Colonel A. S. Waugh, Surveyor-General of India; and likewise to the Dinner, which would take place at the Freemasons' Tavern, at seven o'clock, when he hoped to see the Chair well supported by the Fellows and their friends.

The papers read were :—

1. *Papers relating to the Himalaya and Mount Everest.*

A. By Lieutenant-Colonel A. S. Waugh, Surveyor-General of India, dated Dehra, March 1st, 1856; and

B. By B. H. Hodgson, Esq., dated Darjiling, Oct. 27th, 1856.

(*A.*)

Sir,—With my letter No. 99, of 18th December, 1855, I transmitted a Geographical Memorandum on the identification and revision of height of the famous mountain of Dwalagiri, originally measured by Captain W. S. Webbe, and at one time supposed to be the highest mountain in the world, though my operation in 1847 proved Kunchinginga to be much higher.*

You are aware that the computations of the positions and elevations of all the principal peaks of the stupendous Himalaya, comprising 18¼ degrees of longitude, from Assam to the Safed Kho, have been provisionally completed, and I intend to make this subject one of special report for publication.

Previous to publication, however, it is essential that the computations should be scrupulously revised and every refinement of correction introduced. This I do not expect will materially modify the results.

The revision has proceeded to some extent, and I am now in possession of the final values for the peak designated XV in the list in the Office of the Surveyor-General of India.

We have for some years known that this mountain is higher than any other hitherto measured in India, and most probably it is the highest in the whole world.

I was taught by my respected chief and predecessor, Colonel

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* *See* Asiatic Researches, vol. xii.

Geo. Everest, to assign to every geographical object its true loca or native appellation. I have always scrupulously adhered t this rule, as I have in fact to all other principles laid down by tha eminent graduist.

But here is a mountain, most probably the highest in the world without any local name that we can discover, or whose native appellation, if it have any, will not very likely be ascertained before w are allowed to penetrate into Nepal and to approach close to thi stupendous snowy mass.

In the mean time the privilege, as well as the duty, devolves o me to assign to this lofty pinnacle of our globe, a name whereby i may be known among geographers and become a household wor among civilized nations.

In virtue of this privilege, in testimony of my affectionate respec for a revered chief, in conformity with what I believe to be the wis of all the Members of the scientific department, over which I hav the honour to preside, and to perpetuate the memory of that illu trious master of accurate geographical research, I have determine to name this noble peak of the Himalayas 'Mont Everest.'

The final values of the co-ordinates of geographical position fo this mountain are as follows, viz.:—

Mont Everest, or Himalaya Peak XV.

Latitude N.	Longitude E. of Greenwich.	Height above Sea-level.
° ′ ″	° ′ ″	Feet.
27 59 16·7	86 58 5·9	29,002

As it will be interesting to you to see the independent results fo all our observations to this mountain, and to contrast them wit those of other celebrated peaks, I herewith append an atteste statement of the geographical positions and elevations of Dwalagiri Mont Everest, Kunchinginga, and Choomalari.

You will perceive that the results are all satisfactorily accordant In the case of Mont Everest the accordance of the independen heights is closer than could have been anticipated, because th mountain, though lofty and massive, is not a sharp well-defined pea and was observed from great distances.

You are at liberty to make use of these results, in anticipation c my forthcoming report on the positions and elevations of all th principal peaks of the Himalaya range.

In justice to my able assistant J. Hennessey, Esq., it is proper t acknowledge, that I am greatly indebted to him for his cordia co-operation in revising these computations.

Geographical Position and Height above Sea-level of certain Points in the Himalaya Mountains.

H. S. signifies Hill Station. T. S., Tower Station.

Intersected Object.	Station of Observation.	Latitude N.			Longitude E. of Greenwich.			Height above Sea-level.
		°	′	″	°	′	″	Feet.
Choomalari, or I.	Senchal, H. S.	27	49	41·5	89	18	43·1	23,946
	Tonglo, H. S.			41·5			43·1	41
	Mean	27	49	41·5	89	18	43·1	23,946
Kunchenginga, or IX.	Dom Dangi, T. S.	27	42	9·5	88	11	26·4	28,151
	Senchal, H. S. ..			9·3			26·2	50
	Birch Hill, S.			9·4			26·2	63
	Thakoorganj, T. S.			9·8			26·7	47
	Tonglo, H. S.			9·3			26·2	80
	Banderjoola, T. S.			9·2			26·1	42
	Menai, T. S.			9·2			26·3	72
	Baisi, T. S.			9·6			26·3	60
	Harpoor, T. S. ..			9·5			26·3	40
	Mean	27	42	9·4	88	11	26·3	28,156
Mont Everest, or XV.	Doom Dangi, T. S.	27	59	16·5	86	58	5·8	..
	Menai, T. S.			17·1			6·1	28,990
	Harpoor, T. S. ..			16·5			5·7	9,026
	Ladnia, T. S.			16·7			5·8	8,999
	Janjpati, T. S... ..			16·7			6·0	9,002
	Miriapoor, T. S. ..			17·0			5·8	9,005
	Jirol, T. S.			16·7			5·8	8,992
	Mean	27	59	16·7	86	58	5·9	29,002
Dwalagiri, or XLII.	Ramnagar, T. S. ..	28	41	47·9	83	32	8·8	..
	Morairi, T. S. ..			48·1			8·3	26·815
	Banarsi, T. S.			48·1			8·7	..
	Saoubarsa, T. S. ..			47·8			8·9	60
	Poovenah, T. S. ..			47·8			8·9	43
	Ghaos, T. S.			48·2			8·2	6
	Toolsipoor, T. S. ..			48·2			8·4	61
	Anarkali, T. S. ..			47·8			8·8	..
	Mean	28	41	48·0	83	32	8·6	26,826

NOTE.—The longitude is referable to the old value for the Madras Observatory, 80° 17′ 21″, to which a correction of 3′ 25·5″ is applicable to reduce to the value adopted by the Admiralty and Royal Astronomical Society, or 3′ 18″ to reduce to the result of Taylor's observations up to 1845.

(*B.*)

SIR,—In the report which has just reached me, it is announced that a "nameless" peak, situated north-east of Kathmandu, and in east longitude 87°, had at length been definitely ascertained by our very able Surveyor-General, Colonel Waugh, to be upwards o 29,000 feet high, and consequently to be the loftiest, yet known peak of the Himalaya.

Agreeing as I do with Colonel Waugh in the propriety of adopt ing native names, and cordially sympathising with the sentimen which gave rise to the name Mount Everest, I trust I may be pe mitted, without offence, to state, in justice to my friends th Nepalese and to myself, who have been so long connected wit them, that the mountain in question does *not* lack a native an ascertained name; that that name is Dévadhúngá, Holy hill, o Mons Sacer; and that it is expressly referred to under that name i our Journal. To the paper styled 'Route from Kathmandu t Darjiling,' there is appended a 'Memorandum relative to the seve Cosis.' In the latter occurred the following words: "The Bhoti Cosi" has its source at Déodhúnga, a vast Himalayan peak situate 60 to 70 miles east of Gosainthán, and which Colonel Waugh con jectures may rival Kunchenginga in height." In the rude sketc map which accompanied that paper, Déodhúngá was set down i the position indicated, and that that position tallies with the sit of Mount Everest, is clear from the words above quoted, sinc "60 to 70 miles east of Gosainthán," answers precisely to eas longitude 87°, Gosainthán being in 86° east longitude.

Other indications equally correspond, and at the same time sho why such an object could not remain unnamed or unascertained.

Thus Dévadhúnga and Mount Everest are both "about 100 mile N.E. of Kathmandu;" both are midway between Gosainthán an Kangchan; and, lastly, both are by their position and by th absence of any like mass of snow in all the intervals between thos peaks, identifiable with the so-called Kútighát, or the great *Gat* which annually for half the year is closed by Winter upon th Eastern highway of Nepalese commerce and intercourse with Tibe and China.

A few words more may be given to this last point, as being th matter which chiefly fixed my attention, as a political officer i Nepal, on the site of Mount Everest, and enabled me at once, whe I heard in after years surmises of the great height of a peak in tha direction, to fix on Dévadhúnga, or Bhaíravthán (both names ar used) as being the "enormous snow mass" in question; and I hav often of late repeated this here, very recently to Mr. Blanford Round the shoulder of Dévadhúngá runs, as above intimated, th great Eastern highway (the western being round the shoulder o Gosainthán) of the merchants and envoys of Nepal proceeding t Lássa and Pekin; and this passage along the shoulder of the hug snowy mass of Dévadhúnga is denominated the Kutighát by the Hindoos and the people of the plains of India, as the passage round the huge snowy mass of Gosainthán is denominated by them the Kérung, or Western Ghát. But Kúti and Kérung are names of towns, the one situated considerably within, and the other considerably beyond, the respective gháts; and, moreover, the word ghát is never used by the highlanders (Parbattias) of Nepal for a snow-pass. Their word is "langúr," and the especial langúr in question is named Bhaírava lángúr, or the pass of Bhaírava, just as the mass above it, is called Bhaíravthán, or abode of Bhaírava: Bhaírava being the terrific form of the God Siva. Every merchant and statesman at Kathmandu talks familiarly of the Bhaírav langúr, owing to its formidable character, its obstructiveness (it bars the road to the North for half the year), and its strange contrast with that very extensive and very level tract of country in Tibet, called the Tingrí Maidan, on which the Bhaírav lángúr immediately opens. And this marked character of the ghát, added to the unmarked character of the peak above it, may be one reason why the two are often confounded under the same appellation. But Dévadhúnga and Bhaíravthán are nevertheless sufficiently familiar and correct names for this peak, or snowy mass rather; and it were indeed a strange circumstance, if so remarkable a natural object had escaped the notice of the people of the country and thus remained unnamed. Nor would it have been very creditable to me after 20 years' residence in Nepal, had I been unable to identify that object. The two papers herewith submitted, together with those formerly submitted to the Asiatic Society of Bengal,* or to Government, will, I trust, show that I have given as much attention to the general subject of Nepalese Geography as my opportunities and training admitted and my duty required, whilst the foregone remarks must satisfy every one that this special object, supposed to have been heretofore utterly unheeded, was one so situated and circumstanced that no reasonable excuse for ignorance of it on my part could be made, it being clear that personal approximation was no more a necessary condition of ascertaining the name than it was of deter mining the height, of Dévadhúnga.

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* 1. Military road throughout the centre of Nepal from Kamaon to Sikim; to the Government.

2. Route from Kathmandu to Tazedo on Chinese frontier, to the Society, and published in its Researches.

3. Route from Kathmandu to Darjiling, to the Society, and published in its Journal.

4. Physical Geography of Himalaya, to the Society, and published in its Journal.

5. Visit to Nagakote, with notice of the rivers flowing into it. Printed in the Journal.

6. Various routes through Nepal, from and to places specified. Sent to Government, and deposited in its archives.

7 and 8. Two Journals of embassies from Nepal to China, now sent.

The only doubt in my mind is the greater or less prevalence i Nepal Proper of the term Devadhúngá.

Having possibly obtained it from persons dwelling in the vicinit of Kúti, not at Kathmandu, I have written to Kathmandu to deter mine that question, and will here only add, that should the nam prove to be more familiar to the people of the Cosean basin, than t those of the valley and capital, it will not be one whit less a "tru native name," just as Colonel Waugh's own "Powhanri" is as true native name, as Dr. Hooker's "Dónkia," in relation to a Sikim pea and Ghát.

B. H. HODGSON.

To the Secretary of the Royal Geographical Society.

The PRESIDENT was sure all who were present would be delighted if thi mountain should for ever retain the name of the distinguished geographer who following Lambton in the great trigonometrical survey of India, had been th means of carrying on that magnificent operation, which had been conducted t a conclusion by Colonel Waugh. A more appropriate name could not be give than that of Mount Everest; and, whatever might be its name in India, h hoped, in England at least, it would always be known by the name of Everest

MR. PRINSEP, F.R.G.S., said it was known that the Himalaya range extende many degrees in length, and that in the whole course of it there were mountains of various heights. Some of them were the highest in the world. Thos which had been really measured, overhung the plains of India, and unti recently, it was supposed that the highest were near the sources of the Ganges Since then, however, the discovery had been made that there was a mountai 28,000 feet high; and the present discovery showed another in Thibet, withi sight of the territory of Nepal, 29,000 feet high. When we came to measur the mountains, in which the rivers of China rose, we should perhaps find som of them 30,000 feet high.

COLONEL EVEREST, F.R.G.S., begged to say that the very kind manner i which his successor and friend, Colonel Waugh, had spoken of him was fa beyond his merits. He had certainly an arduous task in India to perform and he did his best to bring it to maturity. One of the best measures h effected was to bring forward into the department a gentleman of Colone Waugh's talents. The Court of Directors of the East India Company ha the good sense to select Lieutenant-Colonel, then Lieutenant Waugh, upon hi (Colonel Everest's) representation of his merits. Colonel Waugh had full borne out those representations, and he believed the Court of Directors wer thoroughly satisfied in accepting his recommendation. The decision of Colone Waugh, in giving his name to this high mountain, he certainly never contemplated. But as a spontaneous effusion of the regard of those Indian surveyors the most efficient of whom were bred in the department, educated in fact b himself, the proceeding was very grateful to him personally. Yet he mus confess there were objections to his name being given to this mountain, whic did not strike everybody. One was, that his name was not pronounceable b a native of India. The name could not be written in either Persian or Hindi and the natives could not pronounce it. It would be confounded with that of O'Brien, and the hill people would probably call this mountain Ob'ron. As another instance of the difficulty which the natives experienced in pronouncing English names, he might, among others, mention that the name of the "Hon. Mr. Cavendish" was pronounced by them "Humbel go mundee."

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2. *Notes on Moham'rah and the Chaab Arabs, etc.* By Col. Sir HENRY RAWLINSON, K.C.B., F.R.G.S., etc.

SIR H. RAWLINSON said he held in his hand a report upon Moham'rah and the Chaab Arabs, which he had prepared for the information of Her Majesty's Government about thirteen years ago, when the dependency of the first-named place was contested between the governments of Persia and Turkey, and when those powers had accepted the arbitration of England and Russia in the settlement of the dispute. Although this report, treating almost exclusively of political geography, might, perhaps, with some alterations and additions, be made fit for publication in the Journal of the Geographical Society, still he thought the Meeting, instead of having inflicted upon them a dry catalogue of barbarous names, and a still drier disquisition on the nationality of disputed territory, would prefer hearing something of the actual position and history of Moham'rah, a name which had now become, as it were, a household word in our annals. Therefore, instead of reading the official report, he proposed to divide his address into three parts. In the first place, he would trace upon the map the configuration of the adjoining country and explain something of the actual geography of Moham'rah. In the second place, as the ancient history of Moham'rah was of considerable interest, he would read a few notes which he had drawn up upon the comparative geography of the region in which it was situated from the earliest times. And, thirdly, if time permitted, he would offer a few observations upon the place, as connected with our recent military operations; that is in reference to the Persian war which had just been brought to a conclusion by Sir James Outram.

Moham'rah, as the meeting was aware, was the scene of our latest, and he hoped he might say, our last, military exploit against the Persians. It had thus become a place of very great interest; but he believed that at the present hour (as the town was not marked upon any of the standard published maps), there were very few people who were acquainted with its exact position. He proposed therefore, in the first place, to show exactly where it was, and to trace the geography of the surrounding country. The map before the Meeting exhibited the whole of the northern coast of the Persian

Gulf. It might be remembered that in the first instance the expedition of General Stalker had landed at Bushir, and that from that place a second expedition had subsequently moved on to Moham'rah. The line from Bushir to Moham'rah ran across the northern part of the gulf to the mouth of the Euphrates, Moham'rah itself being placed at this point, and the only practicable mouth of the Euphrates being here, and when he called this a practicable mouth, he might add that it was not practicable in our ordinary acceptation of the term—that is, it was not practicable like the Thames. He believed, indeed, that in the highest tide there were never more than three fathoms on the bar, and generally the depth of water was but from twelve to fourteen feet. He remembered on one occasion when he sailed into the Euphrates in her Majesty's ship 'Clio,' Captain FitzJames, the vessel grounded on the bar to the great horror of the captain, who immediately assailed the old Arab pilot for his carelessness in not keeping the ship in deeper water. The pilot, however, was by no means disconcerted; he very composedly sat himself down on the quarter-deck, with his pipe in his mouth, and replied as follows:—"Really," he said, "I did not make the 'Clio,' nor did I make the Euphrates; if you will come here in a big ship like this, and go across the bar, you must expect to get into the mud. But it will not hurt you," he added; "if you only wait here quietly till the tide rises you will get off without damage." And such was the case. The mud was so soft that no inconvenience whatever was experienced, and as soon as the tide rose the vessel floated off and pursued her way up the river.

On the present occasion he understood that the entrance channel at the mouth of the river had been buoyed throughout, so that the vessels would probably have all crossed the bar without grounding. If any of the ships had, however, run aground in the mud, they would get off again without injury as soon as the tide rose. There was but one practicable entrance to the Euphrates. Very few of the river beds marked upon the map as forming the Delta of the Karún and Euphrates, were navigable; most of them, indeed, were entirely dry. The only channel practicable for vessels of any considerable draught was the most western mouth of the Euphrates. From the embouchure the distance to Moham'rah was about forty miles. In proof of the difficulty of entering the Euphrates it might be observed that the flotilla which left Bushir on the 19th of March was only enabled to attack Moham'rah on the 26th, a full week afterwards, although the actual distance was under 200 miles and the transports were towed up by steamers.

After he had read his notes upon Moham'rah he should describe how he supposed the attack to have taken place, judging from his personal knowledge of the country, and from the accounts he had received from the spot, of the commander's intentions. At present it was of more importance that he should explain the particular geographical configuration of the place, in reference to its national dependency: one of the questions constantly asked being, "Where is Moham'rah? is it in Persia or in Turkey? or is it on the frontier between the two countries?" Now there was a little map hanging on the wall, which had been drawn up by the Turco-Persian Frontier Commission, presided over on our part by our associate Sir Wm. Fenwick Williams, and which showed the exact frontier between the two countries the whole way from Ararat to the Persian Gulf. This survey he might say, *en passant*, was one of the most valuable and important geographical works which had been undertaken for a very long time past. The whole line of frontier stretching from Ararat to the Persian Gulf, together with a considerable extent of territory on either side, had been minutely and scientifically surveyed by English and Russian officers, under the direction of Sir Fenwick Williams on the part of the English government, and of General Tcherikoff on the part of the Russian government. The sketch-map hanging on the wall merely exhibited the result of that great survey, the details of which were, he believed, now being again put together at Constantinople, after an interruption of some years caused by the war which took place between Turkey and Russia. The line of frontier, they would perceive, ran down here, from the extremity of the mountain-range to the sea. He must explain that the physical law which was held to regulate territorial distribution between Persia and Turkey in this quarter was, that the country watered by the Euphrates belonged to Turkey, and the country watered by the Karun belonged to Persia. Moham'rah was here. The great Persian river Karun came down in that direction from the north-east, while the Shat-el-Arab, formed of the Tigris and Euphrates joined together, came down in this direction from the north-west. The question was, then, whether Moham'rah was on the Euphrates or on the Karún? If on the Karún it was Persian; but if on the Euphrates it was Turkish. After a great deal of discussion, all the *pros* and *cons* being given in the report which he held in his hand, it was decided that it should be Persian. This decision he believed to be contrary to geographical propriety; but nevertheless it might have been a proper decision in a political point of view; in fact, if it had not been so ruled, and Persia had not been encouraged to consolidate her position on the lower Euphrates, we should not have been able at the present day to have exerted that pressure upon her in the occupation of Moham'rah which it might be hoped would now definitively put an end to the war. If we took geographical precedent, he believed it could be shown that Moham'rah was certainly on the Euphrates; and if on the Euphrates, it most unquestionably belonged to Turkey: the reasons for this geographical distribution he should be able to show when he read his notes on the ancient history of Moham'rah. Extracts, which he should give from Arab geographers, who were perfectly well acquainted with the country, would demonstrate that the Euphrates came to this point and bifurcated here; that this was the eastern branch of the river, called the Bahmeshire; that this, up which the fleet passed, was the western branch: that, in fact, the Euphrates discharged itself into the sea by a delta formed of these two channels; and that the Karún was afterwards brought in through an artificial bed and joined the Euphrates at this point. However, it had been ruled by the Treaty of Erzerum, that Moham'rah was in Persia, and so it would now remain to the end of time. The reason for this settlement assigned at the Conference, was that Moham'rah had been occupied by the Persians for some fifteen or twenty years previously, and that it would be inconvenient to disturb the existing distribution of territory. He might further observe, although it was more a political than a geographical question, that the Turkish government had never been satisfied with this adjudication. In fact, within the last six weeks, when it was known that a British expedition was preparing to attack Moham'rah, the Turkish government entered a formal protest against the movement, stating that although they had agreed to the treaty of Erzerum, which required them to surrender the left bank of the lower Euphrates, yet, as other geographical conditions of that treaty (referring probably to Zohab and Kotur) had not been carried out, they did not consider that they had in the mean time lost their territorial claim to Moham'rah; and that, until that claim was waived, no foreign power had a right to attack the place. A troublesome discussion might have arisen on this point had not the Persians who were in possession of Moham'rah fired on one of our steamers, the 'Comet,' whilst passing up the Euphrates; and thus disposed at once of the protest and the pretended neutrality; because if the Turks had any claim upon the place, they ought to have been able to prevent parties in possession of it from taking the initiative in an attack upon us. The last accounts stated that an answer to the above effect had been given in to the Turkish government, and that, immediately afterwards, the expedition entered the river, sailed up, and attacked Moham'rah.

Having thus given a popular account of the geographical position of Moham'rah, and of the respective claims upon it by Persia and Turkey, he thought he might pass on to the second portion of his subject, and read his notes on the ancient history of the place; after which he should feel himself more at liberty to discuss any general matters relating to it. He might explain that these notes, written off hurriedly, and merely referring to the ancient geography of the country, could not be expected to excite much interest; but there were two points contained in them to which he particularly wished to direct attention. One was the evidence they afforded of the whole of the country at the mouth of the Euphrates being new. He should be able to show that the great capitals of the country at the commencement of history were far up the river, about here and that century after century, with a fresh accretion of land, a fresh emporium was formed lower down the Euphrates, until we descended to the present day, and saw successive villages rising, one after the other, as the sea receded, and new lands were available for cultivation. That was one point. Another matter to which he desired to draw attention was, that this particular district of Moham'rah was, some 2000 years ago, the seat of a very famous Greek, or quasi-Greek kingdom. Although the present village of Moham'rah might not exactly occupy the site of the old capital, still the country dependent on it formed the kingdom of Characene, which was of much political importance in its day, and the Greek coins of which were still in great request among antiquarians.*

If the meeting would allow him he would say a few words with regard to the modern question, and endeavour to introduce them to a better acquaintance with Moham'rah under its present aspect, and with the surrounding country. They knew exactly where Moham'rah was situated, and before he proceeded farther, he would give them some information as to the condition and appearance of the modern town.

Sir Henry then read an account of the fort from his notes, and explained the reasons which influenced Sir James Outram in selecting Moham'rah as his point of attack. So long as he remained at Bushir he could only act on the defensive. He could not proceed inland or adopt any offensive measures for two very sufficient reasons; firstly, because he had no carriage, and secondly, because the passes which barred his progress were impracticable to an army. To have remained therefore in position at Bushir would have been a mere idle demonstration, leading to no result; yet Sir James Outram, it must be remembered, had no reason to suppose that a treaty would be concluded at Paris, or that the war would speedily finish. Anticipating a sustained resistance on the part of Persia, his object was to obtain a certain position, which would enable him to carry on the war with vigour and effect hereafter; and for that object it was absolutely necessary that he should, in the first instance, secure a strategic base. Such a base then he rightly judged to be only obtainable at Moham'rah, where the obstacles which impeded operations at Bushir would no longer require to be encountered. At Bushir, there were not only the passes to contend with but there was also a deficiency of carriage, and the latter difficulty appeared insuperable, for there were no camels in that part of the country, and if mules were obtained in sufficient quantities, they would require a corresponding amount of forage, which the district about Bushir was quite inadequate to supply. But at Moham'rah the General would be able to draw camels to any extent from Turkish Arabia, for the whole country teemed with them, and, moreover, in regard to the physical character of the region, the army could ascend the country up to the foot of the mountains without any difficulty whatever. He did not *know* what Sir James Outram's ultimate intentions had been, but that commander, he thought, probably saw that by obtaining command of the country up to Shuster, or to the base of the mountains, he would really make a great impression upon Persia—such an impression indeed as in all probability would bring the Persian government to reason. If this expectation had not been realized—if the Persians had still held out, whether Sir James Outram, in prosecution of the war, would have attempted to penetrate still further into the interior, was a matter which there was fortunately no occasion to investigate. His own idea was, that Sir James Outram would have found it extremely difficult to advance beyond Shuster and Dizfúl. But in Oriental countries experience had shown that we might always safely count on the enemy succumbing to moral pressure before there was any real necessity, and the result of the Persian war afforded no exception to the rule. At the same time it should be understood that it was not absolutely impossible to enter Persia from Moham'rah. There were several caravan routes leading to the interior of more or less difficulty. One route which had been traversed by many Europeans, led from Khuzistán, by Ram Húrmuz and Bébahán, through the mountains to Shiraz. It involved of course an enormous circuit, instead of passing direct from Bushir to Shiraz, to go by sea in the first instance from Bushir to Moham'rah, and then by land from Moham'rah to Shiraz. But still the line in question had been considered as a possible means of entry into Persia, being the same which was followed by Alexander in his march from Susa to Persepolis. The direct road across the mountains from Shuster to Ispahan, he pronounced to be absolutely impassable for our armies, encumbered as they were with "matériel" of war; it was with difficulty that a laden mule could traverse the ranges; therefore to talk of transporting our artillery and ammunition, stores and baggage from one point to the other, was simply absurd. Again, there was a line running due north from Dizful to Búrújird, passing along the precipitous banks of the Dizful river, but that was still more difficult than the Ispahan route, and was in fact little better than a sheep track. Then there were two other lines which he had himself followed, leading from Dizful into the interior. One went direct over the hills to Khorremabad —it was badly supplied, and was, he thought, impassable for troops. The other line led up the valley of the Kerkha to a certain point called Jacedur, where it bifurcated, one route branching off to the east to Khorremabad, and the other proceeding due north to Kermanshah. The last named line was just passable: it was difficult, but still it could be traversed by troops; and if the war had been prolonged, and General Outram had desired to penetrate into the interior from Khuzistan, he would in all probability have been obliged to follow up this difficult and circuitous line to Kermanshah.

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* Sir H. Rawlinson here read his notes on the Comparative Geography of Moham'rah and the vicinity, which will be published in due course in the Journal.—ED.

The observations he had thus made referred however only to contingencies; he had merely been speculating on what might have happened if the war had been continued. At present it would be more interesting perhaps to explain what had actually taken place, or, at any rate, what might be supposed to have taken place in regard to the movements of the expedition. He had explained that General Outram left Bushir on the 19th, and that he attacked Moham'rah a week afterwards, on the 26th of March. Upon the plan suspended on the wall were marked the exact positions of all the Persian batteries, showing how the enemy had proposed to defend the entrance into the Moham'rah creek. One battery was at this corner, another was placed a little further on; and a third occupied the opposite corner; the fire of the three batteries concentrating at one point. Here, in the middle of the Euphrates, was a shoal which prevented a vessel of any size from clinging to the right bank of the river, and thus passing to the north of the creek. But the ships of the expedition, with their heavy guns, must have destroyed the batteries in a very short time, and as the information previously received from the spot stated the Persian troops to be all ready to retire, immediately the guns were dismounted and our troops were prepared to land, he inferred that such had been the actual result

of the attack. The Persians appeared to have retired as fast as th
were able from Moham'rah immediately we landed, and to ha
never halted till they reached Ahwaz, where they were overtak
by a flotilla of small steamers and again dispersed.

Now the object of General Outram in taking Moham'rah was,
he had before stated, to obtain a strategic base, in order to
enabled to advance with safety into the country. His reasons f
thus desiring to advance into the interior were three-fold. In t
first place a general had to provide, as far as he was able, for t
health of his troops. A consideration of not less importance was
make arrangements for feeding them, and in the third place it w
desirable to locate the troops in a strong military position. The
three objects then could only be obtained by advancing up the riv
from Moham'rah. Had General Outram remained at Bushir
could not have fed his troops at all; the cavalry at any rate mu
have starved; and again, if he had remained at Moham'rah aft
taking it, the troops would have suffered dreadfully from t
climate, for notwithstanding that the place was supposed by som
to be the site of Paradise, it was in reality about the most pest
lential spot in the whole Eastern world. When the Frontier Com
missioners, General Williams and General Tchirikoff, were e
camped at Moham'rah in the spring of 1851, there was not,
believed, a single individual of their party who was not put *hors*
combat at one time or another from fever. Three years ago
remembered that the Persians had sent 500 men to garrison M
ham'rah during the summer, and when relieved in the autumn onl
100 men had marched out of the place. That, however, it mu
be admitted, was considered a bad season, but under ordinary ci
cumstances the yearly mortality was about 50 per cent. The cau
of this unhealthiness was the marsh malaria produced by the decom
position of vegetable matters under a burning sun, added to t
great humidity of the atmosphere in the immediate neighbourho
of the sea. But on proceeding up the river, although the heat co
tinued to be great, the climate was comparatively healthy. T
heat, he must repeat, was extreme in this country of Susiana, a
always had been so. Strabo mentioned on the authority of o
of Alexander's generals, who had visited Susa, that the snakes a
lizards could not pass across the streets from one side to the oth
without being burnt up. That story, whether intended to be take
literally or not, would at any rate give an idea of what the Gree
thought of the heat of Susa. He could not say that he had e
perienced quite the same degree of heat, but still it was undoubted
very trying; he had remained in Susiana up to the end of May,

about a fortnight after the great heats had fairly set in, and at that time the thermometer used to rise daily to 130° in the up-stair rooms, obliging him, in common with the rest of the inhabitants, to take refuge in subterranean caverns excavated in the solid rock 40 or 50 feet below the surface. The population of Shuster and Dizful, during the great heats, thus lived almost entirely under ground. But from that place (Dizful), in two days, he got upon the snowy mountains and enjoyed a most delightful climate. As our troops would have to remain in Persia through the summer, the treaty providing that they should not retire until three months after the ratification, which would take place early in the month of June—and June, July, and August being the three worst months in the year—he could only hope that the General would not remain at Moham'rah, but would take up a position in the interior of the country, either at Ahwaz itself, or at any rate half-way between Moham'rah and Ahwaz, beyond the reach of the malaria. In such a position, if the troops were well hutted, and the huts were surrounded with camel thorn, the temperature could be reduced to quite a bearable point. In fact when the thermometer at Baghdad in the shade had been 125° or 130°, he had seen in houses of this sort, surrounded with camel thorn, and constantly watered to produce evaporation, the temperature reduced as low as 80°, and with ordinary care the thermometer would never rise above 90°. He, accordingly, hoped that General Outram would take these precautions and canton his troops on the river, either at Sabla or Ahwaz, where the dryness of the atmosphere was peculiarly favourable to evaporation, such as he had described. With regard to food also, the whole of this province of Susiana at the present time was one mass of the most luxuriant vegetation. There was probably no country in the world richer than the neighbourhood of Shuster. The river Karun, above Shuster, was divided into two branches, which joined again about thirty miles below, and the country between the two arms reticulated with canals, and cultivated throughout, presented the aspect of one continuous garden, and yielded all sorts of tropical productions, some of which he might enumerate. In the first place there was a vast quantity of sugar-cane, and the manufacture of sugar had always been carried on, it would seem, to a great extent in the province, one of the classical epithets of the article in Persian poetry being derived from a city in the vicinity of Shuster.* Then there was a considerable cultivation both of opium

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* The allusion is to the *Kend-i-Askerí*, or "Sugar of Asker," so called from the city of *Asker-i-Mokrim*, of which the ruins are to be seen on the left arm of the Karun (the *Masrukán* of the geographers), a few miles to the north of *Bend-i-Kir*.

and indigo, the latter of which products it had been stated
long ago in that room, would only grow in India; he would
say that the Shuster and Dizful indigo was of first-rate qual
but it was sufficiently good for the ordinary uses of the count
and he might add that one-fourth of the opium used in Pe
was said to be grown at Shuster and Dizful. There were a
produced in Khuzistan and the adjacent districts, rice, cott
madder, cherry-sticks, gall-nuts, and especially mules and hor
and wool. So that it would be seen that the province of Khuzis
was not only valuable in a military point of view, but also i
commercial one, and although at the present time there was no id
he believed, of our retaining permanent occupation of the provin
still the Persian government must be equally aware with us, of
value, as well as of its being entirely open to our arms, and th
combined considerations would, of course, act as an inducement
them to get us out of the country as quickly as possible by agree
to our terms.

He had only further to point out that the province in wh
Moham'rah was situated was so oppressively hot in summer t
the governors never ventured to remain there during that seas
All the provinces of Persia were under the rule of Prince govern
members of the Royal Family being sent from the court of Tehe
to administer the several divisions of the empire, but no spec
governor was ever appointed to this province to remain there p
manently. Khuzistan (or Arabistán, as it was now genera
called) was placed under the rule of the governor of some otl
province. It was sometimes attached to Kermanshah, sometimes
Ispahan, and occasionally to the subordinate governments of Kh
remabad or Búrújird. At present it formed a part of the gove
ment presided over by Khanler Mirza, the Prince who had be
defeated by our troops at Moham'rah, but he merely came down
collect the revenues, and inspect the government of the coun
during the winter, and immediately the heats came on, which w
generally by the end of April, he ascended the mountains again
his capital city of Búrújird, where he enjoyed an agreeable clim
throughout the summer. Our troops would not be able, probab
as he had before explained, to ascend the mountains, but they co
at any rate obtain healthy quarters at Ahwaz. There was a rid
of sandstone stretching across the desert for above 1000 miles, whi
struck the river Karun at this point, making it impossible fo
steamer to ascend higher without very considerable difficulty.
imagined that General Outram would canton his troops below t
bund, as it was called, in order to keep up an uninterrupted riv

communication with Moham'rah, and if such should prove to be the case—if General Outram, that is, did canton his troops at Ahwaz during the summer, and there were any further affairs with the enemy, which might make it of interest to the Society to hear more of the geography of the upper part of the river, he should be happy on a future occasion to communicate what he knew.

The PRESIDENT was glad they had returned thanks so heartily to Sir Henry Rawlinson for his remarkable communication. Sir Henry had the advantage of being a great critical scholar, of having accurately studied, not only the histories of ancient times, but of having compared all these sites, so famous in ancient history, with their actual condition in the present day. He really came before them as an antiquarian, as a physical and, he might say, a political geographer, and that last feature in his character had perhaps most interested the Society upon the occasion. For his own part, he would not dwell one moment upon the very valuable communication which had been offered to their consideration.

GENERAL MONTEITH, F.R.G.S., said, when he was in the country, it was then a doubtful point whether Moham'rah belonged to Persia or Turkey. It was after the mission to which he was attached had finished their labours that the Persians took possession of Moham'rah. The Sheik of Chaab possesses lands in both Persia and Turkish Arabia, and never paid tribute without being coerced. Mahomed, the great Sheik, dug a canal from the Karun to the Persian Gulf, to avoid paying the customs to Turkey. The mouth of the canal was still open near the small village of Sabla. He also constructed a bund which was broken by Kerim Khan after his capture of Busrah. The temperature of the Karun in summer is 20° lower than the Euphrates. General Monteith next spoke of the physical features of the country, and, with reference to the Karun, stated that in ascending that river to Ahwaz he met with the remains of a sluice, which, if a lock were made, would afford communication as far as Shuster. Respecting the passage into the interior, General Monteith said the route from Shuster to Disful was over a beautiful country, perfectly easy for artillery or anything else. But the march from Shuster, which was the line followed by Alexander, offered obstacles still more difficult than the passes to Shiraz. For a distance of 90 miles the country was destitute of water. From Ahwaz it was 64 miles across a desert, till you came into the valley of Ormuz; then, from that point, you might pass on, without any great obstacle, to the beautiful valleys of Sir-ab-Sea and Fallian, than which nothing could be more lovely, nothing more delightful than the climate. But here was a pass fully as difficult, if not more so, than any of the passes between Shiraz and Bushir. He surveyed the passes between Bushir and Shiraz, and, with some labour, he thought they were capable of being made passable for artillery, provided possession were taken of the heights, which must be done by whatever pass is taken.

MR. CRAWFURD, F.R.G.S., had only to make a short explanation respecting what passed the other night upon the indigo question. Sir Henry Rawlinson fancied that he considered indigo the sole product of India. That was not what he intended to convey. All he meant to say was, that, of all parts of Asia, India was the only country in which a marketable indigo could be produced. He ventured to say that the Bussora indigo would not fetch sixpence in the pound in the London market, while the indigo of Bengal and of Guatemala would fetch five and six shillings. He should like also to ask Sir Henry Rawlinson, what he thought could induce Alexander the Great to plant Greek colonies in such a climate as had been described, or how he could bring himself to believe that Greeks would thrive with the thermometer at 130° in th shade?

Sir H. Rawlinson replied that the Greek settlement at the mouth of th Euphrates was a well known historical fact. Alexander not only planted colony at the head of the Delta, but he gave to the surrounding tract c country the name of Pellæum, after his native village Pella, in Macedonia He presumed the object to have been one of national glory rather than a mer consideration for the comfort of the Greek soldiers; Alexander cared littl perhaps whether the settlement throve or not, but that he did fix a colony in th vicinity of the modern town of Moham'rah was certain. We had further th evidence of the coins, struck in Characene with Greek legends and Greel dates, to prove that the colony must have continued, under Arab or Partho Arab kings, to exist at the mouth of the Euphrates for several hundred years As to the doubt expressed whether Greek colonies could thrive in the grea heat of that country, he could not help referring to the remarkable cas of Seleucia, where the heat must have been fully equal to that of Moham'rah the town being situated on the upper part of the Tigris, about 20 miles belov Baghdad, but which, nevertheless, contained a Greek population of 100,00 souls, among whom Greek arts and literature were cultivated almost a ardently as in Europe. Some of the most interesting descriptions that w possessed of Greek society occurred in Plutarch's notice of Seleucia, under th Parthians (after the defeat of Crassus), with reference to the acting of th plays of Euripides in that city before an audience composed of Greeks an Parthians. It was well known indeed that the Greek cities of the East flourishe quite irrespective of climate or of European comforts. He supposed that th Greeks did deteriorate, as Englishmen also deteriorated in India. But whils we had an Indian empire, administered by resident Englishmen, we need no wonder at the establishment and maintenance of Greek colonies in the countrie situated on the Tigris and Euphrates.

Mr. Montgomery Martin, F.R.G.S., said it would be interesting to kno the declination of the country from Moham'rah to the northward? what wa the nature of the soil, as regarded its salubrity? and how far Sir Henry Rawlinson thought our gallant soldiers would be able to sustain four or fiv months' residence in that country, without the loss that would arise from th extreme heat? Because the extreme heat was not always destructive of lif When he was at Aden, where the heat was intense, the mortality in the 17t was only 3 per cent.

Sir Henry Rawlinson could only make a few general remarks upon th sanatory question, because he had not examined the country between Moham'rah and the mountains with that especial view. He only knew th sanatory effects practically and from general observation. Near the sea ther was an extensive marshy region, where the climate was most deadly, owing t the malaria which was engendered, he supposed, by the constant decompositio of vegetable matter in a tropical sun. But when this marshy region was onc passed, the country was perfectly dry, the rivers remaining in deep beds i their course, and never flooding the adjacent lands. No rain fell except i the spring, at which period the whole country was covered with a mo luxuriant and wholesome vegetation, principally rich, thick grass, which h had no doubt would be mowed by our troops and turned into serviceable ha In April and May the grass on the banks of the Kerkha and Shawer rivers wa so thick that it was difficult to force a horse through it; and such was the cas all the way up to Shuster and Dizful. There was comparatively little irrigation in the plains of Susiana. The desert was chiefly watered by the rains c heaven. All this country was, of course, originally formed by alluvium, tha is, by detritus from the mountains. The rise from the sea to Shuster, nea the foot of the hills, was probably 1½ foot per mile, so that the base c the mountains might be about 400 feet above the level of the sea. But from that point the mountains rose abruptly, and, as he had already mentioned, on the second day after leaving Dizful he entered into the region of snow. The whole of the upper country, that is, between the marshy belt to the south and the mountains to the north, was healthy, although there was a good deal of heat during the summer months. But we had had experience of this heat in our former expedition to the Gulf when we occupied Karak. At first there had been great mortality, because the European soldiers were lodged in tents and were placed on sentry in the sun equally with the natives. It thus not unfrequently happened that a European soldier on guard was struck down by a *coup de soleil*, and that the party from the regiment sent out to bring in the man and place another sentry, lost two or three men from the same cause before they returned. The European authorities accordingly soon came to the conclusion that it was necessary to place natives only on sentry; and as the Europeans were shortly after lodged in huts of palm-mats and otherwise well cared for, it was found, before we had been a year on the island, that the mortality was not greater in Karak than it was in any of the warm stations of India, such as those in the north-west provinces. He felt satisfied if the same precautions were now adopted at Ahwaz, with the additional advantage of using wet screens made of camel-thorn facing the hot wind, which naturally produced evaporation, that the troops would not suffer more from the heat than in the north-west provinces of India.

A VISITOR, in reply to Mr. Crawfurd's statement that Bengal and Guatemala were the only countries which produced indigo, stated that Guatemala did not produce an ounce of indigo; it produced only cochineal.

MR. CRAWFURD presumed that indigo must have been manufactured in Guatemala, because it went under that name. He did not know into what particular parts of America the manufacture had been extended.

The PRESIDENT, in closing the discussion, reminded the Society that the next meeting would be their Anniversary. The Society had so rapidly increased —numbering at present nearly a thousand Fellows—that the Council had to look out for a larger place of meeting. Various propositions had been made, among which was one that he, the President, should represent the case to the Earl of Granville, as the head of the Board of Education, and request permission to hold the meetings of this Society during next session in the theatre of the Government School of Mines, in Jermyn Street. If it should be the pleasure of the Society, as it was that of the Council, he was quite ready, as Director of that establishment, to apply to the proper authorities on behalf of the Royal Geographical Society.

The resolution was unanimously passed.

SIR GEORGE BACK next said that the Geographical Society had now arrived at that period when it was customary to make some changes in the Council. Those changes had been proposed that day in the Council, but one important omission had occurred—that of nominating the President for the ensuing year. They would all remember that Sir Roderick Murchison, on the demise of the late lamented President, Admiral Beechey, accepted the office with an understanding that it should not extend beyond the regular time, and the able manner in which he had fulfilled the duties was patent to all. Everyone knew his courtesy, and most of them had partaken of his hospitality. Indeed, he knew no gentleman who could have conducted the affairs of the Society more efficiently than Sir Roderick Murchison had. He appeared to be in such admirable health, and to have thriven so much upon the work, that with their permission, he would propose that Sir Roderick Murchison be President for the ensuing two years.

COLONEL EVEREST having seconded the proposition, it was carried unanimously.

SIR RODERICK begged to assure the Society that when he took the Chair, on the demise of his lamented friend Admiral Beechey, he said with all sincerity, that he did not feel that he could efficiently carry out the duties beyond this Anniversary. Having found that with the work, he had thriven, as it were, in health, he was ready to continue his services, if the Society thought him worthy of it. He could only say that, if he should be elected at the next Anniversary, he should consider it the highest honour that could be conferred upon any scientific Englishman; for he should then have entered into his third Consulate, *i. e.* his third Presidency; and, if he lived to a future Anniversary, he should have delivered six Addresses to the Society, all of them infinitely too long, but all prepared with the greatest pleasure—a pleasure the greater, if he could believe that they had conduced, in the slightest degree, to the advancement of geographical science.

PRESENTATION

OF THE

ROYAL AWARDS

TO

MR. AUGUSTUS C. GREGORY, THE EXPLORER OF NORTH AUSTRALIA; AND LT.-COLONEL ANDREW SCOTT WAUGH, DIRECTOR OF THE TRIGONOMETRICAL SURVEY OF INDIA.

THE President opened the Meeting by making the following statement of the grounds on which the Council had awarded the Medals:—

The Founder's Gold Medal has been awarded to Mr. Augustus C. Gregory, for his extensive and accurate surveys in Australia, and particularly for his last great and successful exploration of North Australia and his journey thence, or from the Victoria of Stokes to the Colony of New South Wales, as recommended by the Royal Geographical Society, and carried out under the orders of Her Majesty's Government.

When Her Majesty's Government decided that an exploration of North Australia should be made upon the general plan advocated by this Society, and in accordance with the suggestions of our members Stokes and Sturt, they wisely selected so experienced an Australian surveyor as Mr. Gregory to carry out this great and important project. That gentleman was already well known to us by his successful labours in unravelling the condition of the interior of Western Australia, as recorded and mapped in the 18th and 22nd volumes of our Journal. In the first of these journeys (in 1846) he ascertained that the inner part of that colony is generally flat, broken here and there by low hills of granite or other igneous rock, the depressions being usually occupied by salt lakes or marshes, no fresh-water streams having yet been detected. In 1848, Mr. Gregory proceeded from Perth on what was termed "the Settlers' Expedition," or an endeavour to discover a tract of good land in the latitude of Champion Bay, and, if possible, to penetrat to the Gascoyne river, which falls into the northern part of Shar Bay. Crossing the Moore and Arrowsmith rivers, he ascended th Murchison, for 50 miles towards its source, and found some ric soil on its banks. Determining everywhere his positions astr nomically, he proceeded to the affluents of that stream and mad ineffectual efforts to force his way through the dense brush scrub of the waterless, arid plains south of Shark Bay; when th exhaustion of his horses, great heat, and the sterile sandy so proved to him that the interior of the colony could only be explore in the moist winter months. He therefore returned to Pert having travelled about 1500 miles without detecting any notabl quantity of good land, and having failed in reaching the Gascoyn river, from the want of fresh water and the impenetrable thicket of scrub.

Most of the officers of the last and great expedition, whic we had so long advocated, having been sent from England t Sydney, the expedition was there placed under the orders of M Gregory. Being properly fitted out under the directions of ou associate Sir William Denison, the Governor of New Sout Wales, and proceeding thence by sea through Torres Strait an along the north coast of the continent, it reached the great bay first made known to us by Capt. P. King in 1819, the easter gulf of which, or Queen Strait, and its stream the Victoria, wer explored by Wickham and Stokes in 1839.

Having ascended the Victoria, with the schooner Tom Tough as far as was practicable, Mr. Gregory established a camp on th right bank of this stream, at about 80 miles from its mouth. Wit his brother, Mr. H. Gregory, Mr. J. S. Wilson the geologist, an Dr. Ferdinand Mueller the botanist, he then explored the Victori to Jasper Creek, determining the geological nature of the country and ascertaining that the river made a great southward bend Again taking with him his brother, and Dr. Mueller, togethe with the artist, Mr. T. Baines, he marched southwards to ascer tain if the saline desert, which Sturt had discovered in proceed ing inland from the southern regions of Australia, and which h had himself found to prevail in Western Australia, was also to b met with in a journey southwards from the north coast.

For this purpose he ascended the Victoria to its source, an found the hilly or dividing range to have an altitude of 1660 fee above the sea. Traversing this watershed, he descended by stream flowing south, which he named Sturt Creek, and which, bending to the S.S.W., terminates in a desiccated salt lake near Mount Wilson, in S. lat. 20° 2′ and E. long. 127° 5′. Whilst the south-eastern and southern slopes of the dividing range were thus proved to be everywhere dry and sterile sands, the whole of the territory to the north of the same presented the most striking contrast, being generally fertile in grasses, particularly the extensive grounds named Hutt Plains and Roe Downs.

In this first effort, therefore, made specially by the advice of our medallist Sturt, the grand geographical and statistical feature, which was suspected to exist, was brought to the test; and we may now fairly infer, that all the central portion of this continent, as well as the long southern coast-line examined by our associate Eyre, and a considerable maritime frontier of Western Australia, constitute an uninhabitable desert, probably the dried-up bottom of a sea, and that hence all future intercourse between our Australian colonies must take place either along the fertile coast ranges, or by sea.

Returning to his camp, which he had left under the charge of Mr. Wilson, who had in the mean time examined the adjacent country, of which he sent home a sketch map to this Society, Mr. Gregory sent away Mr. Baines, with Mr. Wilson, and the larger number of his party, in the schooner; and after giving directions that the vessel should meet him at the head of the Gulf of Carpentaria, he set out on his chief mission, accompanied by his brother, Mr. Elsey the surgeon, Dr. Mueller, and three men.

Quitting the basin of the Victoria, and passing over a broad table-land of sandstone, he entered a valley watered by a tributary of Leichhardt's river, the Roper, which he named Elsey Creek, in S. lat. 15° 15′ and E. long. 133° 10′. He next took a south-south-easterly direction to the west of Leichhardt's route, or about 70 miles distant from the western shore of the Gulf of Carpentaria, and traversed the various rivers discovered by his adventurous precursor (but nearer to their sources) until he reached the Albert, which empties itself into the head of the Gulf. Not meeting there with the party sent by sea, under the orders of Mr. Baines, he left the 'Plains of Promise' of Stokes, and crossed the river Flinders at about 80 miles distance from the Albert, and, journeying to the north-east, fixed a position on the Gilbert River at S. lat. 18° 0′ and E. long. 140° 40′. Ascending that stream, Mr. Gregory left behind the drainage into the Gulf of Carpentaria, and traversed the high basaltic plateau which separates the waters flowing into that gulf, from those which descend into the great eastern ocean. To the dividing high la he assigned the name of 'Newcastle Range,' in honour of the Se tary of State for the Colonies, who had sanctioned the expediti Reaching the Burdekin, he followed that stream south-eastwa to its junction with the Cape river of Leichhardt.*

The next march showed the connection of the Suttor of Lei hardt with the Belyando of Mitchell; then striking south-west f the latter stream, Mr. Gregory skirted the Peak range, the extr point to which squatters have extended their dwellings, *i. e.* S. lat. 23° 41′ and E. long. 147° 50′, or about 560 miles from head of the Gulf of Carpentaria.

Whilst a great breadth of entirely sterile tracts, with only one sulated rich spot on the river Roper, prevails between the basin of Victoria on the north coast and the Gulf of Carpentaria, with oc sional poisonous plants, Mr. Gregory found nearly all the vast reg between the eastern side of the gulf and the northernmost statio our settlers, to be more or less fertile. During the last week the expedition the horses fattened, and after traversing the riv Mackenzie, Comet, Dawson, and Burnett, the party reached Brisbane and Moreton Bay in excellent health.

The value of the researches of Mr. Gregory and his associa cannot be appreciated until all their records, and the general m now in course of compilation by Mr. Arrowsmith, shall h been published; although we already know how vastly our acquai ance with the geographical distribution of plants has been larged by the collections of Dr. Mueller.† In the mean time, h ever, the geographers of all countries will admit that we h rightly awarded our Founder's Gold Medal to the successful plorer of such vast unknown lands, through which his united jo neys have amounted to upwards of 6500 miles, and in making wh he has determined many points of longitude as well as latitude, has accurately defined the character of a fine basin of North A tralia, which may probably, at no distant day, become a Brit colony,—a subject which will be particularly alluded to in discourse which follows.

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[*] It is my pleasing duty to state a fact which is in the highest degree cr table to Mr. Arrowsmith. That acute and indefatigable geographer, without other guide than his own comparison of somewhat discordant materials, placed upon his map the point of the confluence of the Burdekin and Cape Riv or Mount M'Connell, at not more than ten miles in error of the precise longit 156° 50′ E., determined by Gregory: for the latitude only had been fixed Leichhardt, viz., S. lat. 26° 30′.—R. I. M.

[†] *See* Sir W. Hooker's Journal of Botany.

The President, having read the preceding grounds of the award, rose, and thus addressed the Right Hon. Henry Labouchere :—

"Mr. Labouchere,—Having taken for many years the liveliest interest in the exploration of North Australia, it has been peculiarly gratifying to me to see this very difficult operation effectually carried out by a surveyor of the Australian colonies, so admirably qualified to ensure success as Mr. A. C. Gregory.

"On this memorable occasion I rejoice that you, Sir, her Majesty's Secretary for the Colonies, under whom this great task has been happily terminated, should have honoured us by attending here to receive for the explorer of North Australia the Founder's Medal of our Society, which I request you to transmit to Mr. Gregory with the expression of our entire and hearty approbation of his conduct."

Mr. Labouchere replied :—

"Sir,—It affords me sincere pleasure on this occasion to receive, on the part of Mr. Gregory, this well-merited mark of approbation of the Royal Geographical Society. That gentleman had been selected by the Government for the arduous and important task of exploring the vast regions yet unknown to civilized man in North Australia, and the manner in which he has performed it has amply justified the selection.

"Of Mr. Gregory's scientific qualifications it would ill befit me to speak before such an audience, but I may advert to those moral qualities which were not less necessary to an explorer of those vast solitudes. Sir William Denison, in a despatch which rendered a high testimony to the merits of Mr. Gregory, observed that it was to his prudence and courage that the safe return of the entire party was probably due.

"You have called attention, Sir, to the description which Mr. Gregory gives of the soil and climate on the banks of the Victoria river; and, indeed, it is of such a nature that it is no extravagant supposition that some of us may live to hear of that hitherto unknown region becoming the home of a prosperous English settlement.

"Such anticipations have always been a source of great gratification to my mind; for I believe that, among the many blessings and advantages which have been permitted to this country, none ought to be ranked higher than, that she should have been enabled to scatter so widely over the globe the manners, the freedom, the civilization, and the religion of Englishmen."

Mr. Labouchere concluded by assuring the Meeting that he would transmit the medal which he had received from the hands of their distinguished President to Mr. Gregory, who, he was sure, would highly value such an honour.

The President then continued :—

The Council has adjudicated the Victoria or Patron's Gold Medal to Lt.-Colonel Andrew Scott Waugh for his valuable and able extensions of the Great Trigonometrical Survey of India, and particularly for his recent triangulation carried on through Rajputana, the Panjab, and the Himalayan Mountains, thereby adding to our geography an accurate and intimate knowledge of a part of the globe most interesting to mankind at large, and of vital importance to Great Britain in particular.

This Trigonometrical Survey of India was commenced by Colonel Lambton in 1803, and continued by him till his death in January 1823. During that period he measured an arc of the meridian from Punnæ in 8° 9′ 35″ near Cape Comorin to Damargidda in lat. 18° 3′ 16″, being about ten degrees of latitude, and extended a net of triangles over the south part of the Peninsula of India, reaching on the east side of the principal meridian to the 19th parallel. Colonel Everest, who had been his chief assistant since 1817, and succeeded him at his death, completed the section commenced by Lambton, and extended the arc to Seronj, lat. 24°, near which place he measured a base of verification. This is the most important base in the Trigonometrical Survey of India, as all the work to the north, east, and west is dependent upon it. Colonel Everest carried on the measurement of the meridional arc to its completion in the Dehra Dún, lat. 30° 19′; the whole extent from Cape Comorin being 22½° of latitude. He also extended a longitudinal series from the Seronj base to Calcutta, in the neighbourhood of which he measured a base of verification. From points selected on this series originate distinct sets of meridional series, the northern limits of which are united by a longitudinal series running along the foot of the great mountain chain, which thus completes the triangulation of that vast tract, comprising about 223,000 square miles.

When this distinguished officer left India, Colonel, then Captain Waugh, who had been his chief assistant since 1832, was appointed his successor in December 1843, and following up the admirable plan of survey laid down by his predecessor, the principles and methods of which have been described by Everest,* he worked out the several series left unfinished between the meridional arc and that of Calcutta. Finally he measured a base of verification at Sonakoda, lat. 25° 18′, long. 88° 18′, and also completed the triangulation of the south coast series from Calcutta to Ganjam.

Colonel Waugh then commenced operations on the west of the great meridional arc, and measured a longitudinal series from the base at Seronj, passing through Rajputana and the sandy desert to Karachi, upwards of 700 miles in extent, where a base of verification was measured, whilst the triangulation of the Bombay meridian was connected with this series. He further extended another series in a north-west direction from the stations of the meridional arc, Banog and Amsot, through the plains of the Panjab and a great portion of the mountainous tract to Peshawar. Again, a base of verification was measured near Attock, the series embracing an area of about 67,000 square miles. A meridional series is far advanced from the base at Karachi, along the Indus, to that near Attock. This operation will complete a gigantic geodetical quadrilateral, of which the great arc series forms the eastern side. Simultaneously with these trigonometrical operations, most minute and elaborate topographical surveys have been executed under the superintendence of Colonel Waugh throughout the greater portion of these tracts.

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* Account of the Measurement of the Arc of India. 2 vols. 4to., 1847.

Lastly, having determined that of all the mountains whence the affluents of the Ganges run, the loftiest summit is situated about midway along the Himalayan chain, and finding that this culminating point (N. lat. 27° 56′, E. long. 86° 53′) was 29,002 English feet above the sea, and consequently 846 feet loftier than the famous Kinchinjanga of Nipal, Colonel Waugh has gratefully and appropriately named this, the highest known elevation in the world, Mount Everest, after his valued geographical instructor.

These great results appear to come peculiarly within the scope of the Society, which takes for its motto "Ob Terras Reclusas;" for eight years ago, the mere exploration of the tracts in question would have been deemed impracticable, whereas under the direction of our Medallist, a vast portion of these countries is now accurately delineated, on the basis of astronomical observations, connected by the highest appliances of modern geodetical science and art.

The President rising thus addressed Colonel Everest:—

"Colonel Everest,—The reasons which induced the Council to adjudicate the Patron's Gold Medal to Lt.-Colonel Waugh having been made manifest by the document I have just read, I now place this our tribute to his ability and success in your hands, requesting you to convey it to your eminent associate, with the assurance that we deeply appreciate the importance of his labours.

"By transmitting this Medal, through your medium, to the officer who learnt his lessons under your able guidance, the Royal Geographical Society recognises the right of your predecessor Lambton and yourself to have had similar distinctions: and I rejoice that by this one act, the grand Trigonometrical Survey of India should now receive a reward which it so long ago merited."

Colonel Everest replied :—

"Mr. President,—I beg to return my acknowledgments for the complimentary terms in which you have been pleased to advert to the labours of my honoured predecessor and myself, and on behalf of my esteemed successor Lieutenant-Colonel Waugh to express the warmest thanks to yourself and the Royal Geographical Society for the very proud mark of distinction which has just been conferred on him, by the award of the Patron's Medal of this year.

"The applause of our fellow men is naturally prized by us all, and nothing is more cheering to a person engaged in an arduous undertaking, replete with privations and hardships, than the persuasion that, if he endures to the end, his labours will not be unrequited. Colonel Waugh, however, is not of that stamp to need such a motive to induce him to persevere in the strict performance of his duty, and having no precedent which could hold out the prospect of such a distinction as the present, it will come on him altogether as an unexpected boon, and as such, will be additionally acceptable. I am certain that this Medal will be received by Colonel Waugh with the deepest and most sincere feelings of gratitude and respect for those who selected him for the proud honour of possessing it, and not only by himself, but by all the members of the department of which he is the chief, will this adjudication be hailed as an earnest that there is a body of gentlemen most qualified by their talents and knowledge to form a judgment, and as willing, as able to act according thereto, with right singleness of purpose. Sir, if anything could enhance the value of this mark of distinction, it is the circumstance that it has been conferred during the presidency of a gentleman of wide renown—known wherever civilization reaches—acknowledged even by our antipodes as one of the first geologists of the age, and not more distinguished by his scientific attainments than by his courtesy, urbanity, and kindness of heart.

"The Trigonometrical Survey of India has been in progress ever since 1803, a period of 54 years, and will in its entirety, embrace a tract which exceeds the area of Great Britain and Ireland in the ratio of about 12¼ to 1. Of course a vast deal still remains to be accomplished before so gigantic an undertaking can be pronounced complete; and as Colonel Waugh has now been engaged in this arduous task for 25 years, it is needless to expect much prospective effect from the present award as far as he is concerned, for his career in India must be drawing towards its close; but the memory of the present graceful act of this Society will assuredly not be lost on his eventual successor, or on India in general. He is still in the prime of life, and though he has suffered lately from more than one severe attack of illness, yet it is to be hoped that the injury which his constitution may have thereby sustained, is not greater than can be restored by a return to his native country, and that he will some day arrive to return his thanks in person to the Royal Geographical Society, and by his co-operation and counsel add fresh vigour to the active exertions of a body so effective—the first—the only learned Society in England, let me say, which has ever held out the hand of sympathy, friendship, and encouragement to the Great Trigonometrical Survey of India.

"Mr. President and Gentlemen, I thank you for having listened to me so patiently, and I conclude with my earnest wishes, that the prosperity of this Society may continue, until every portion of this globe shall have been as satisfactorily explored and as accurately delineated, as the regions under the influence of the Honourable East India Company."

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 25th May, 1857,

BY SIR RODERICK IMPEY MURCHISON,
G.C.St.S., D.C.L., F.R.S., &c.,
PRESIDENT.

GENTLEMEN,—Having been called, through your kindness, to resum the honourable duty of presiding over you at a season, when th Royal Geographical Society has attained a condition more flourishing than its warmest well-wishers had anticipated, it is grievous t open this Address by dwelling upon the decease of my predecessor, the gallant Admiral Beechey, as well as that of my successo when I vacated this chair in 1854, the noble Earl of Ellesmer Never since the foundation of our body has the hand of deat fallen so heavily and so rapidly upon our leaders, and never ha a more painful task been thrown upon your President, than that c recording the loss of two such men, however mitigated by th endeavour to do justice to their eminent and dignified character To delineate all their merits, even if I had the power, would b impracticable in the brief space of time to which I can lay clai on this occasion, and I shall, therefore, simply endeavour to plac on record some of the salient features in the characters of m lamented friends, which more particularly connect them with th great pursuits of this useful Society.

Rear-Admiral Frederick William BEECHEY, the son of the late Si William Beechey, R.A., was born in February, 1796, and before h reached the age of ten years was already serving as a midshipma in the Royal Navy. He bore a part in Commodore Schomberg brilliant and decisive action off the Isle of France in 1811, an after active employment in the expedition to New Orleans in 1815, he soon attained the rank of Lieutenant.

In 1818, public attention was again attracted to Polar exploration, which had been neglected during a lapse of forty-five years, chiefly through the exertion and energetic writings of our associate, the late Sir John Barrow. Lt. Beechey then served in the expedition under Buchan, and was appointed to the Trent, commanded by Franklin, who was also accompanied by Back. Having coasted the west side of Spitzbergen, they were finally arrested by heavy floe-ice in lat. 80° 36′ N. From some mistaken feeling on the subject, no account of the proceeding was published till 1843, when Beechey, remembering old Hakluyt's imputation on some of our early writers, who he says "should have used more care in preserving the memoires of the worthy actes of our nation," brought out, under the authority of the Admiralty, a most interesting narrative of the voyage.

Subsequently our adventurous young officer joined the Hecla, and assisted the first great effort of the celebrated William Edward Parry (his former shipmate) to cut through the barrier of ice into Barrow Strait, beyond the 110th degree of west longitude, for which these officers and their companions justly received a parliamentary reward. In 1821-2 he had the good fortune to serve under the orders of our former esteemed President, Admiral W. H. Smyth, then surveying the Mediterranean, in co-operation with whose ship, the Adventure, he explored a considerable portion of the north shore of Africa.

During the three and a half succeeding years the sands of Cyrenaic Africa were exchanged for Pacific and Arctic researches, when, commanding the Blossom, Captain Beechey made accurate surveys of many islands in the Pacific, of the coasts of Russian America and of Behring Strait, of all of which he has left an admirable record in the work entitled 'Narrative of a Voyage to the Pacific and Behring Strait, to co-operate with the Polar Expedition.' In this publication, our respected President has left a record of scientific knowledge which places him high among the standard authors of our time.

To one portion of this work, which describes the exhumation of such vast quantities of bones of mammoths and other extinct mammalia from the cliffs of Escholtz Bay, in Russian North America, the late Dr. Buckland has rendered full justice.

At a later period, Captain Beechey surveyed the west coast of South America, and determined many points of high geographical importance. Lastly, examining the shores of the Irish Channel, and performing much severe and valuable service to the detriment of his health, he produced many highly useful charts, and threw much light on the nature of the Channel tides. The result of these, his last labours afloat, was the publication of two very able and valuable memoirs in the 'Philosophical Transactions.' The first of these (in 1848) was entitled 'A Report of Observations made upon the Tides in the Irish Sea, and upon the similarity of the Tidal Phenomena of the English and Irish Channels,' &c. The principal object of the author was to point out the independence of the *set* of the *tide-current* in those seas, on the actual *state of the tide* as ebbing or flowing; and he showed, by a masterly exhibition of the facts, that there is no apparent connection between the direction of the stream and the rising or falling of the water. In addition to this, he laid down instructions for ascertaining the state of the tide, the value of which was much enhanced by two explanatory charts and many smaller diagrams.

This memoir, addressed to Sir F. Beaufort, was followed in 1851 by another letter to the same eminent hydrographer, which was written with the hope that its contents, when sufficiently known and circulated, would be the means of diminishing the number of those losses of both life and property, with which the annals of Lloyd's abound, and of advancing our knowledge of the tides, by the practical illustration of the phenomena of the tidal streams of straits under the influence of a combined wave.*

After the cessation of his arduous maritime exertions, Captain Beechey was appointed to the important post of Superintendent of the Marine branch of the Board of Trade, the duties of which he executed to the day of his death in a manner which drew from every successive Minister of the Department, the warmest acknowledgments of that clearness and precision of thought, and that skilful performance of official duty, which characterized our late President throughout his whole career.

Obtaining the rank of Rear-Admiral in 1854, he succeeded the Earl of Ellesmere in this Chair in 1856, and we all know with what sincerity he devoted his energies to the advancement of geography, how ably he directed our proceedings, and with what urbanity he presided over our meetings. Alas! I have too much reason to believe that the zealous endeavours he made to serve us, combined with the important duties of his office in regulating and improving the scientific instruction of the mercantile marine, acting on a constitution which had been sorely tried in many a clime, hastened that catastrophe which we so deeply lament.

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* Phil. Trans., 1851, p. 717.

Not long after his election to the post of President he was attacked by a severe illness, from which he only partially recovered during a summer's voyage in the yacht of the Trinity House. To that malady he feelingly alluded in the opening part of his excellent Anniversary Address—the only one he was permitted to deliver—when he thanked the other officers of our body for the effective manner in which they had conducted the affairs of the Society during his absence. On coming with his family to Tunbridge Wells in the autumn, where I happened to reside, I found that our zealous President was suffering from a disease of the heart. His affectionate wife and daughters then felt indeed, as well as myself, that the utmost tranquillity was essential to the preservation of his valuable existence; but he persisted in struggling with unflinching spirit to transact business both at the Board of Trade and in our Society. So dominant was this feeling that on Monday the 24th November, Admiral Beechey attended the rooms of this Society, and gave me, as the Vice-President he had selected to represent him, precise directions for conducting the business of the Council and of the evening meeting of that day. On Saturday, the 29th, alas! he was no more; thus exhibiting that firm resolve to do his duty to the last, which has ever been the glory of those British seamen among whom Admiral Beechey stood pre-eminent. He had long been a distinguished Fellow of the Royal Society, and was a member of the Council of that body at the period of his decease.

Francis, Earl of Ellesmere, a Knight of the Garter, Lord-Lieutenant of Lancashire, and our President during the years 1854-5, was the second son of the first Duke of Sutherland, and that gifted lady the Duchess Countess of Sutherland. He was born in 1800, and died on the 18th of February, 1857.

In endeavouring, with the approval of the Council, to induce this accomplished nobleman to succeed me in occupying the Chair of this Society in the year 1854, I felt certain, from an acquaintance of thirty years' standing, that through his varied knowledge, generous nature, and love of geography, he would render us right good service. His conduct in directing our affairs has indeed met with your hearty approval; and as we lamented that our rules, limiting the presidential duties to two years, led to his re ment, so we have now to grieve over his demise, at the paratively early age of 57.

Educated at Eton, and distinguished at Oxford, Lord Fra Egerton soon took a high place in the House of Commons, served with ability both as Secretary for Ireland and Secretar War. As he advanced in years he seemed to care less and les political distinction; and as it is not my calling to dwell on ministerial or parliamentary career, let me briefly remind you he occupied many hours of his well spent life in cultivating cherishing letters, science, and art.

I will first speak of those anonymous writings which, as t have exercised a salutary influence on society, ought to be m known, both to render justice to the man, and to indicate the g variety of his acquirements.

My auditors, who may have only known Lord Ellesmere a member of either House of Parliament, or as our President, not be aware that between the years 1834 and 1854 he was contributor of not less than fifteen articles to the 'Quarterly view;' and that about one-half of them were connected with development of geographical research. Eschewing the troub arena of party strife, he left no trace behind him of polit acrimony even in those essays which touched upon disputed q tions; whilst all of them, which did not bear upon the scie we cultivate, were devoted to the fine arts, of which he was a t connoisseur, or to biography, and those military exploits wh have raised the glories of Britain.

On geographical subjects he began by such attractive account the works of the Dutch authors Meiglan, Fischer, and Doeff, that one who will peruse his 'Sketches of the Manners and Usages of Japanese' will find in them a most vivid picture of the life of t curious people, who, inhabiting a region separated from either c tinent, are apparently destined to remain longer an unbroken than the colossal empire of China. Of the Japanese he humorou wrote that he "left them to the complacent enjoyment of the c viction that they are the first of nations, and the eldest descend of the Deity."*

Turning to the Eastern Archipelago, he has consigned to u memorial of the lively interest he took in that chivalrous expedition of our old associate, Sir James Brooke. After a preliminary sketch of the preceding wretched condition of Borneo, condensed from the descriptions of Sir Stamford Raffles, he painted, with the hand of a skilful master and a warm friend, all that the adventurous Irish gentleman was accomplishing. Every old member of the Raleigh Club and of this Society, recollecting the deep interest we felt in the successful voyage of the little schooner of the Yacht Club, fitted out by Mr. Brooke, will re-peruse with gratification the lines, which indicated that the young explorer of that day was destined to become the Rajah of Saráwak, and to receive not only our gold medal, but his due reward at the hands of his Sovereign.

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* Quarterly Review, vol. lii. p. 317; vol. lvi. p. 438.

In his recent translation for the Hakluyt Society, of the Père d'Orléans' 'Hist of the Tartar Conquerors who subdued China,' Lord Ellesmere was largely assi by his accomplished daughters.

Then, in his analysis of Arctic and Antarctic researches, Lord Francis Egerton gave long ago earnest that he was worthy to become our leader. In his review of the narrative of discoveries on the north coast of America, made by the officers of the Hudson Bay Company, in which the enterprising Simpson lost his life, we find him evincing those large views and kindly feelings which led him invariably, in subsequent years, to countenance and support those expeditions in the search after Franklin, which have shed so much lustre upon our country.

Again, when commenting in 1847 upon the memorable Antarctic discoveries of Sir James Ross and the natural history collections of Dr. J. Hooker, we see how emphatically he dwelt upon the exploits which he anticipated from our Arctic heroes when he penned these lines:—

"With interest which accumulates by the hour do we watch for the return of those two vessels, which are perhaps even now working their way through Behring Strait into the Pacific. Should the happiness be yet allowed us of witnessing that return, we are of opinion that the Erebus and Terror should be moored henceforth on either side the Victory, floating monuments of what the Nelsons of discovery can dare and do, at the call of their country in the service of the world." *

This was one only of the many soul-stirring paragraphs indited by my noble friend on a subject so near to his heart—one on which he never abandoned hope, as proved not only by his signing, with many of us, last year that petition to the Government, which is printed in our Proceedings,† praying for the final search of a

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* Quarterly Review, vol. lxxxi. p. 167.

† Proc. Roy. Geogr. Soc., No. iv., p. 95, June, 1856.

limited Arctic area, but also by his willingly undertaking to
that appeal to the House of Lords in the last session of Parlia
which, in his unavoidable absence, was effectively made by
Wrottesley, the President of the Royal Society.

Among the last of Lord Ellesmere's anonymous contributio
geographical subjects, immediately preceding his two elo
addresses to this Society,* I may advert to his lively accou
Castren's Travels among the Lapps, in which he justly eulogise
enterprising Finn and his learned countryman Wallin, the succe
explorer of Arabia. In other fragments of periodical literatu
indicated his admiration and right estimation of engineering
in the article on the Skerryvore Light-House, and again in a
instructive Review of the progress in canalization, proceeding
did from the inheritor of the great Bridgewater Canal.

Of his thorough acquaintance with the fine arts, Lord Elles
has left pregnant evidences in the pages devoted to his esti
of English artists, and to the elucidation of fresco pain
Liberally employing his wealth in making well-chosen additio
the gallery of paintings he inherited, he reared for their preserva
and for the residence of his family, that palatial structure desi
by Sir C. Barry, which has scarcely a rival in our metropolis.

A distinctive feature in the character of Lord Ellesmere wa
deep admiration of martial deeds. His veneration for the Du
Wellington, founded upon a study of his campaigns, was mat
by a personal intimacy of many years, during which the
Captain himself furnished the materials, which enabled our dece
President to give to the world a clear and well-condensed acc
of the battle of Waterloo.

The spirited sketch of the life of Blucher, the 'Marshall
wärts' of the Prussian soldiery, written in 1842,† was followe
1845 by a luminous analysis of the French and English versio
the battle which decided the fate of Napoleon.‡ On these writi
coming as the chief matter in them did *from Wellington himself*,
plicit reliance may be placed; and few historians, I ventur
say, will improve upon the style in which the reminiscenc
the illustrious Commander were conveyed to the public by
deceased Associate. In all such writings, whether he went bac
the days of Wallenstein,§ or traced the struggling career of the

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* *See* Journal Roy. Geogr. Soc., vols. xxiii., xxiv.

† Quarterly Review, vol. lxx.

‡ Ib., vol. lxxvi.

§ Ib., vol. lxi., p. 105.

Scotch General Patrick Gordon,* who fought so well for the Czar Peter, or entered with the lamented Cathcart into the Russian and German campaigns of the first Napoleon,† or stood forth in the hour of trial as the champion of his dear friend the brave Lord Raglan, we invariably applaud the generous sentiments and true appreciation of merit which ever guided the pen in his portraiture of a hero.

The versatility of the talents of Lord Ellesmere was displayed in numerous other works published under his own name. A poet by nature, verses, whether martial, plaintive, or jocose, flowed freely from his heart, and the principal of these being collected under the title of the 'Pilgrimage and other Poems,' the author, with his habitual modesty, spoke of them in his preface as being a collection of the least unpopular of his works.

A master of several languages, he frequently put before his countrymen in good racy English, the thoughts of eminent foreign authors, and of these efforts, the translations of Goethe's 'Faust' and Schiller's 'Wallenstein' are prominent examples. The number of foreign works which he translated may well surprise us, when we reflect upon his numerous occupations, and among them I may enumerate Clausewitz's 'Campaigns of Russia,' the 'Sieges of Vienna by the Turks,' and the 'Last Military Events in Italy.'

Returning to my noble friend's connection with science, let me ask any old member of the British Association if he ever heard from the President of the year a more inciting appeal than was made by Lord Francis Egerton at the Manchester Meeting of the year 1842. Ranging from science to letters and art, he proved that he truly merited the application of that line with which he honoured his predecessor, Dr. Whewell—

"Through each mode of the lyre, and was master of all."

It was then that I rejoiced in being one of those assembled at Manchester, to bear witness that this distinguished nobleman, the possessor of large domains, was as truly esteemed by every artisan of that vast hive of industry, as he was beloved by his tenantry and agricultural labourers.

If it was specially when surrounded by his family and friends that the genuine heartiness and wit of the man came out most strikingly, every public act of his life was carried out with such stedfast sincerity and true liberality, that, whether he presided over a Royal commission, a literary or scientific society, or a parish vestry, he did his duty with his whole heart. Philanthropy and generosity were to be discerned, indeed, in all his actions by those wh how quietly and unostentatiously he sustained with his purs of genius, who were labouring under difficulties, and who, his timely aid, could never have produced works which hav a high place in science and letters.* These acts were well c by that full-handed munificence with which he strove to s our famishing and ill-clad soldiers in the Crimea.

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* Quarterly Review, vol. xc., p. 314.

† Ib., vol. xc. p. 1.

In addition to the stores of varied knowledge which he c all times playfully and instructively draw forth from his ca mind, there was in Lord Ellesmere a fund of cheerful bene which bound to him affectionately every one who enjoy friendship. I cannot therefore better sum up the leading m our former President than in the expressive words of one most intimate and valued companions :—

"His calm exterior and tranquil manner covered a deep enthusiasm for the honour of his country, for the progress an lioration of his species, and for all that was grand and noble in ment or in action.

"They can bear testimony to this truth who have seen him over the recital of some great battle of the Great Duke, or so famous deed of individual heroism,—who have witnessed th interest with which he watched the bold enterprises of navigation,—or who have heard his lucid and animated expla of the mechanical inventions for diminishing labour, or per manufactures, in the vast workshops connected with his property. While his ardent spirit rejoiced in every dis achieved by science, and every new phase of beauty elicited his accumulated knowledge and cultivated taste enabled appreciate the merit and calculate the consequences of each he was ever ready to employ the influence of his position, the and liveliness of his pen, and the princely contributions of his for the furtherance of such purposes.

"His high estimation and assiduous study of the science to the Geographical Society is especially devoted, were the re that large range of knowledge which opened his mind to its i relations—moral and material, social and political—with the destinies of mankind. In him the geographer was blende the statesman and the philanthropist, not in wild and utopia culations (for the poet's imagination was controlled by a sober judgment and a jealous love of truth), but in those prescient views which result from extensive acquaintance with the physical circumstances of remote regions, and from well-reasoned calculations of their several capacities for the advancement of civilization and the increase of human happiness." *

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* Let me cite one of several cases known to myself. When the emine ralist Agassiz was likely to have the publication of his great work 'Les Fossiles' stopped for want of means, Lord Ellesmere gave 500*l.* for the drawings, which he immediately presented to the Geological Society.—R.

Suffering from complaints with which he had long struggled, and aware that the climate of Lancashire was hostile to his frame, Lord Ellesmere still persisted in residing during a portion of the year in that district where he felt he had, by the will of Providence, a responsible task to perform. Raising, therefore, a beautiful edifice near the entrance of his own great Bridgewater Canal, and little distant from the town of Manchester, expending large sums in building churches or founding schools, and ardently pursuing every plan for the bettering of the moral and social condition of the people, he braved the moisture of the climate, and only succumbed when, amidst the blessings of all to whom his influence extended, he had effected the main objects for which he lived. Well might the clergyman,† who preached the funeral sermon over his bier, point, not merely to the exalted character of the statesman, the orator, and the scholar, but specially to the true Christian, the lamented Lord of Worsley Hall, in whom all the surrounding inhabitants felt that they had lost the generous patron, the liberal, indulgent master, the charitable and tender-hearted soother of distress and poverty.

In short, as it was impossible to know him well and not to love him, so the deep sorrow which his death called forth is the noblest monument to the memory of the good Earl of Ellesmere. Such, doubtless, is the real consolation of the high-minded and devoted widow, who, cordially participating in all his acts of beneficence, is left to encourage her children to imitate so bright an example.

DR. WM. BUCKLAND.—Lost to the world and to his numerous admirers for several years through an impaired state of the mental faculties, caused by a diseased state of the bones at the base of the skull and of the neck, my valued friend, Dr. Buckland, the Dean of Westminster, expired on the 14th August, 1856, at the age of 73.

The principal merits of this eminent man and the leading events of his life having recently been brought before the Geological Society,‡ of which he was one of the early members, as well as before

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* Extract of a letter from Mr. Ralph Sneyd to myself.

† The Rev. St. Vincent Beechey, M.A., brother of our last President.

‡ *See* Address of the President, Col. Portlock, R.E., F.R.S., Quart. Journ. Geol. Soc. 1857.

the Royal Society, whose chief honour * he had received, it does not become me to attempt any analysis of those writings upon the structure of the globe or its former inhabitants, which have been justly regarded as among the chief stepping-stones to the present state of geological science. I will, therefore, confine myself to a brief sketch of a few points in his character, which may convey to those who knew him not, some idea of the powers and habits of this great geologist.

Educated at Tiverton and Winchester, he obtained from the latter school a scholarship in Corpus Christi College, Oxford. There it was that, after he had become a tutor in classics, a youth came to the University (Oriel College), who, having already attained an acquaintance with fossil organic remains, was destined through that knowledge to influence the future career of many of his associates who had similar tastes. This was William John Broderip, afterwards my colleague during five years as joint secretary of the Geological Society, and now well known as one of the eminent naturalists of our age.

The study of the collection made by this juvenile companion, including the jaw of a marsupial quadruped found in the Stonesfield slate, first awakened the dormant talent of Buckland. Cultivating the friendship of the precocious fossilist, he soon developed that peculiar power, which characterized him through life, of catching up and assimilating with marvellous rapidity everything that illustrated the new science of fossil organic remains, then just coming into vogue through the work of Parkinson. So strongly did Buckland feel in after years the deep obligations he was under to young Broderip, that I have myself heard him speak of the latter as his "tutor in geology."

Admiring the original efforts of William Smith, who, in identifying strata by their organic remains and by his geological maps, has worthily acquired the title of Father of English Geology, Mr. Buckland made numerous excursions to examine the rocks in various districts, and in so doing sought out the few promoters of the rising science. The kindred scientific spirits of his Alma Mater, whether older men or of about his own age, were Pegge, Kidd, and John and William Conybeare, the last mentioned, now the Dean of Llandaff, rising afterwards to be the rival of our deceased member as the celebrated author of the 'Outlines of the Geology of England and Wales.' Thus working onwards he qualified him-

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* The Copley Medal.

self to obtain that post of Reader in Mineralogy and Geology, in performing the duties of which, he had the great merit of rousing the University of Oxford from its lethargy in respect to the natural history sciences, and in rendering attractive the study of primeval nature.

It is true that his predecessor, Dr. Kidd, had opened out some good paths in the science of mineral geology; but it was reserved for Buckland to create by his native eloquence and his illustrations, a real and solid taste for geology properly so called, whether as based upon the records of lost races of animals, or on physical geography and the mineral composition of rocks.

Those persons who, like myself, can go back to the days when our deceased member was an inmate of Corpus Christi College, can never forget the impression made upon his visitors, when with difficulty they discovered him in the recess of a long collegiate room, seated on the only spare chair, and buried, as it were, amidst fossil bones and shells. So strange was this conduct considered by the graver classicists, and so alarmed were they lest these *amœnitates academicæ* should become dangerous innovations, that when he made one of his early foreign tours to the Alps and parts of Italy, which enabled him to produce one of the boldest and most effective of his writings, an authoritative elder is said to have exclaimed, "Well, Buckland is gone *to* Italy, so, thank God, we shall hear no more of *this geology!*" Augmenting his class of students, however, Dr. Buckland persevered successfully in spite of the opposition of the pedagogues of the old school, and certain narrow-minded theologians, who, ignorant of the imperishable records which the Creator has set before us in the book of Nature, endeavoured to destroy the moral influence, if not the character, of any clergyman who boldly taught those undeniable truths. Success happily attended his efforts, and if Buckland had done nothing more than educate a Lyell, a Daubeny, and an Egerton, he would justly have been placed among the most successful instructors of our contemporaries.

Marking the progress which has been made in this branch of science in the few years which have elapsed since it was publicly taught, we may indeed well look back with pity on its feeble opponents, and rejoice that the alumni of the Buckland school have become such strong men, and that the chair, which owed its origin to my illustrious friend, should now be filled by that sound geologist, John Phillips, the nephew of William Smith, who has added to the genius of that geological lawgiver, the richest accom-

plishments of modern science. The publication of his first ren
able work, the 'Reliquiæ Diluvianæ,' naturally secured for I
land honours and advancement, and through the patronage of
Grenville he obtained a canonry in Christ Church. Shortly a
wards Sir Robert Peel, with the appreciation of true merit w
characterised him, sought out and cultivated his intimacy,
then came forth that 'Bridgewater Treatise' with which his
will be long identified. For to whatever extent new data
since been obtained, this volume will ever remain a proof o
fertility of illustration with which he could reconstruct and se
fore us the forms of bygone periods,* and thus make evide
all, the prescience of the Almighty as exhibited in former ep
of creation. In a subsequent year we find Sir Robert Peel, t
great honour, presenting Buckland to the Deanery of Westmin
in which position, notwithstanding his hospitality and impo
occupations, he still found time to travel to and from his
Mater, and lecture on his favourite science, till he was stri
down with the illness from which he never recovered.

But let no one imagine that, whilst some of his leisure hours
thus occupied, including arduous efforts to improve the agricu
of our country, Dean Buckland was inattentive to his dutie
the Head of an important Ecclesiastical Body. Not only do
surviving colleagues advert with marked respect and gratitud
his judicious efforts and his honourable conduct in improving
establishment, but the public owe to him their real thanks for
energy and determination with which, in a brief space of time
effected the reform of abuses which had crept into the anc
school of Westminster. In that Foundation, education could
longer be obtained except at costly charges, and even where t
were paid, the youths were ill fed and worse lodged. All t
defects were speedily rectified by the vigour and perseveran
Dean Buckland. The charges were reduced, good diet was
vided, the rooms were well ventilated, and the building prop
underdrained; so that, these physical ameliorations accompan
a really sound and good system of tuition, the fame and cred
this venerable Seminary were soon restored.

As it must be my effort when occupying this chair to con
every deceased member with geographical science, let me as
you, from long personal acquaintance with Dr. Buckland, and

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* This work, which was rendered much more valuable by the recent disco
of Professor Owen, was revised by Mr. Broderip.

ing, indeed, received some of my first lessons in the field from him, that he was really a good physical geographer. No one who followed him even from the valley of the Isis to the summit of Shotover Hill, can ever forget how forcibly he impressed upon the minds of his auditors, the causes which had operated in producing the outlines of the ground—how well he made his pupils comprehend why water rose in wells at certain spots and levels, and why other tracts were dry, or how he taught the young agriculturists the elements of draining, and showed them where the vegetation changed as dependent on the nature of the subsoil.

To whatever realm he travelled, whether over the undulations of Germany or the heights and glaciers of the Alps, he adroitly applied and extended these views, and everywhere exemplified (what I have endeavoured to imitate in my own walk) that union of geology with geography, without which the latter science is deprived of its firmest foundation.

While Dr. Buckland evinced enthusiastic zeal and great ability in the development of any phenomena connected with natural history which he could detect, whether in the organization of animals or of plants, he also often sought to apply his science practically. Thus, the most remarkable of these efforts, which I can now call to mind, proceeded from one of his own discoveries. Perceiving that certain fossil convoluted bodies, when extracted from their native bed in the lias of Gloucestershire, presented the appearance of *fæces*, which had assumed that form from passing through the intestines of reptiles or fishes, he submitted the substances to analysis, and when they were pronounced by the late Dr. Prout to be chiefly composed of phosphate of lime derived from the bones of animals, and that even fragments of the bones were detected in them, he assigned to these bodies the name of "Coprolites." With a fervid anticipation he was afterwards led to hope that these fossil bodies would prove of real use to agriculture; and one of the many regrets I have experienced since his bright intellect was clouded, was that my friend had not been able to appreciate the truly valuable results that have followed from this his own discovery, which, at the time it was made, was treated as a curious but unimportant subject, and almost scouted as being too mean for investigation. The hundreds of tons of these phosphatic coprolites and animal substances which are now extracted to the great profit of the proprietors of Cambridgeshire and the adjacent counties, for the enrichment of their lands, is a warning commentary to those persons of

the "cui bono" school, who are ever despising the first germs
scientific discovery.

The full and true character of Dean Buckland is not, howev
to be measured by reference to his works only, including
records of those extinct Saurians of which he was the great l
torian, or his chief work, the 'Bridgewater Treatise,' nor even
his discoveries in a new science. The indelible impression
made upon all who listened to his instructive lectures—lectures l
those which may still happily be heard at Cambridge from the l
of his illustrious contemporary, my old friend and coadjutor Se
wick—and the general influence he exercised over society by t
energetic and telling manner in which he inculcated his doctrin
as founded on observation of the progress of nature from the earli
periods to that icy epoch which preceded the era of his own cav
animals; these are the appeals which have procured for him a na
which will last as long as the school of British geologists, of whi
he was so eminent a leader, shall be remembered!

In closing these few sentences, which, if I were addressing
kindred Society, might be expanded into a volume descriptive
the merits of one to whom I was sincerely attached, let me add th
in his accomplished relict, our lamented member has left behi
him a truly intellectual and excellent woman, who, aiding him
several of his most difficult researches, has laboured well in h
vocation to render her children worthy of their father's name.

Dr. Buckland was a member of many European and Americ
Academies, and a Correspondent of the Institute of France. Eve
where abroad, as at all great British meetings, and in every soc
party, he was invariably welcomed as the most cheerful and m
successful contributor to the advancement of natural knowledge.

Lieut.-Col. NEIL CAMPBELL, who recently died in Paris on h
return from Bombay, was an officer on the Quartermaster Genera
Staff of the East India Company's service, in which he was d
tinguished for his zeal and intelligence. He was best know
to us as the author of the large Military Sketch-map of Scin
During his stay in this country on leave of absence, he was o
of the officers of the Indian Army who attended the funeral of t
Duke of Wellington, and was always a welcome and agreeab
attendant at our Club and Evening Meetings.

Captain Thomas GRAVES, R.N., who recently fell under the kn
of a Maltese assassin, was the son of a gallant officer of the sa
name and rank. Entering the navy in 1816, and serving in seve

vessels on foreign stations, he was chosen, through his merits, to form one of the scientific complement of the Adventure, in which ship young Graves played so able a part, that his Captain, now Admiral W. H. Smyth, and other officers strongly urged his promotion. During the next five years, he was a companion of that excellent officer the late Rear-Admiral Philip P. King, in his extensive surveys of the Straits of Magellan and the adjacent shores of South America, and it was only during that difficult service, and in the year 1827, that he was appointed a Lieutenant, *i. e.*, after ten years of arduous probation.

After performing, in conjunction with the Royal Engineers, a survey of Lough Neagh in Ireland, the next ten years of the life of Captain Graves were spent in surveying the Greek Archipelago, first in command of the Beacon, and next of the Volage corvette. These surveys were suddenly put a stop to by an order of the Admiralty, which both Sir F. Beaufort and Admiral Smyth considered to be an "inscrutable measure," and a heavy blow inflicted on this important branch of the naval service.

Whilst compiling about one hundred charts and plans of the Grecian Archipelago—as interesting to the antiquary and historian as they are valuable to the navigator—Captain Graves had the singular merit of attracting to his little ship the Beacon, as his friend and companion, that young naturalist Edward Forbes, then rising in the estimation of his contemporaries, and who, after passing nearly two years in dredging the Ægean Sea, and in developing the conditions of life and habits of submarine animals at various depths, threw a broad new light upon geological science. The name of Graves must therefore ever be associated with that of Edward Forbes! Even to Captain Graves himself geologists are much indebted, for his numerous contributions of fossils from distant parts. That these were very important all my contemporaries are aware, and particularly those still living, who, like myself, frequented the rooms of that remarkable naturalist Charles Stokes, whose merits I attempted to place on record for the late Lord Ellesmere when he last occupied this chair. To this Society Captain Graves communicated a description of Skyros, and was the cause of our Journal being enriched by the instructive papers of his assistants Spratt and Leycester.

Ever zealous in advancing knowledge, he also afforded to Sir Charles Fellows assistance in the investigation of the antiquities of Lycia, that was duly acknowledged. Such conduct surely called

for some mark of public approbation; but although the Sul
and the King of Greece specially thanked Captain Graves
services important to humanity, this meritorious officer ne
received any honour from his own country. Yet who can plac
comparison with the anxious, untiring energy and science displa
during life by such nautical surveys as those of Thomas Gra
the lucky accident of a few months' war service in the Baltic
the Black Sea, in which perchance the individual decorated
not have accomplished any one feat of arms? Honour then
the Governor of Malta, Sir W. Reid, whose warm sympathy
offered to the neglected and really eminent scientific sailor.
offer of the post of Superintendent of the ports of Malta was willin
accepted, and the gallant Graves had zealously performed the du
of it during three years, when he received a mortal stab fro
revengeful boatman, that deprived our country of his servi
His kind, open-hearted and friendly disposition had long endea
him to every one who knew him; and from a personal intercou
of many years' date, I can well realize to my mind's eye the glo
as attested by the public journals, which spread over the in
bitants of Malta on the occasion of his sad fate. Captain Gra
was an old Fellow of the Royal Society, having been elected
1826, and he was also one of the original members of the Ro
Geographical Society.

Lieut.-Colonel Thomas Best JERVIS, of the Engineers, in
East India Company's Service, who died recently in London, at
age of 60, was formerly well known for his numerous import
works in the Bombay Presidency, including Indian Metrolo
and an elaborate treatise on the primitive universal Standard
Weights and Measures, &c. When a lieutenant, he served as
engineer in 1821 of the field force under Sir L. Smith sent to
Persian Gulf. On that occasion the Arab pirates were subdu
and the Fort of Beni-bu-Ali was taken after a vigorous resistan
operations in which he was distinguished. After repairing a
putting in order many forts he was employed as a captain for
years in making the trigonometrical survey of the Southern Konk
a fertile country at the foot of the Ghauts. This Survey, wh
adjusted by the Grand Trigonometrical Survey, was incorporat
into the Atlas of India, of which it formed several sheets. Fert
in resources, he devoted his residuary leisure to various useful p
poses, such as building a suspension-bridge or opening out sl
quarries in his Eastern abode. In 1838 he was provisiona

appointed by the Court of Directors to be Surveyor-General of India; but the appointment never really took place, as Colonel Everest had not resigned.

Colonel Jervis was the successful translator of Baron Hugel's Travels in Cashmir, and he had, I understand, translated other voyages and travels, which were never printed. Being well known for his untiring energy and his accomplishments as well as for his acquaintance with foreign languages, and having shown his foresight by the publication of a translation of the Russian map of the Crimea, and the rapid transference by the anastatic process of the Austrian military map of Turkey and the adjacent countries, he was proposed to the Treasury, and was appointed during the late war, to organize and conduct a topographical sub-department of the Government, in which he prepared numerous maps and plans. He had been a Fellow of the Royal Society since the year 1838, and was a frequent contributor to the library and map office of this Society.

The Rev. Thomas HALFORD, M.A., Oxford, who died in the 68th year of his age, was a well educated gentleman, and ever desirous of promoting art and science. Being partial to the Geographical Society, and a constant attendant at our anniversaries, we shall this day mark with regret his absence from our festive board.

Sir James MEEK was a highly respected and useful public servant, who, for his administrative talents in the victualling department of the Navy Board, was knighted and honoured with the Companionship of the Bath. An old member of this Society, he served on our Council for several years, and always supported our cause as long as he remained in London. Retiring from public life, he lived during the last few years at Ilfracombe in Devonshire. Being gifted with a kind heart, and possessing the most gentle manners, Sir James Meek was much beloved by all who knew him.

James Meadows RENDEL, the celebrated engineer, has had such ample justice done to his merits by those who can best appreciate them, whether at the Royal Society, or the Institution of Civil Engineers, that it would not become me to weaken such descriptions by any panegyric of my own. The skill and decision which he displayed in many works, such as a cast-iron floating or suspension bridge, and numerous piers and docks, besides innumerable hydraulic operations, were crowned by his two great achievements, the harbours of refuge of Holyhead and Portland. These, in the estimation of his associates, are alone sufficient to hand down his name to

posterity with a Smeaton, a Rennie, and a Telford. Consulted
by various foreign Governments, he was associated with M. Les
and Mr. Charles Manby as one of the International Commission
the construction of the Canal of Suez. Mr. Rendel was born
1799, was elected a Fellow of the Royal Society in 1843, and w
during two years, President of the Institution of Civil Engine
His death, which occurred on the 21st of November, 1856,
deeply lamented by all his friends and associates.

Mr. John KENYON, who died in December last, was born in 1
or 1785. He was, for some years, at Mr. Seyer's school, at
Fort, Bristol, several of his companions from which seminary h
since won for themselves fame and honour in the service of lite
ture and science. Amongst his favourite playmates were Jo
Eagles, known in later days as the author of 'The Sketche
Broderip, the naturalist; and Andrew Crosse, the electrician. Th
schoolday friendships remained through life, unclouded by
shadow.

After Mr. Kenyon quitted the University of Cambridge, he sp
some time on the Continent, but, returning to England, he form
friendships with Wordsworth, Southey, and Davy. He was
only the friend of poets, but was himself a poet; having p
lished, a few years since, at intervals, two volumes which sh
considerable originality, as well as a refined and cultivated tas
These poems breathe the spirit of a mild and tolerant man, wishi
well to his fellow-creatures, with a liberality something more th
orthodox, and seeing all things in the sunny hue of his own ge
rous nature.

Mr. Kenyon's appreciation of genius and talent drew around h
many savans and literati of the day, among whom his genial soc
bility seemed to have the power of amalgamating the most dissimi
natures, and of softening asperities between individuals. He wa
person to whom no man volunteered to tell the worst he knew
his neighbour. He liked to see, talk, and hear of pleasant thing
but he was one who feelingly shared the sorrows of his frien
His heart was ever full of true sympathy, and his hand ever rea
to assist those who required his aid. In one year he spent f
thousand pounds in acts of *private* charity!

Mr. Kenyon died on the 3rd of December, 1856. All those w
knew him well, feel what they have lost; those who knew h
but slightly will not soon forget his ever kind and bland manne
By his noble and generous will he divided his large fortune amon

his numerous living friends, and the children of such of his old friends who had before him "gone to the many."

Vice-Admiral Lord Radstock, C.B., has very recently been taken from us. Born in 1786, and entering into the profession of his father, the well-known admiral, who won the battle off Lagos in 1797, he distinguished himself in several engagements in the Mediterranean, in the last as Captain Waldegrave, and off the Italian coast, in destroying the batteries at the mouth of the Rhone. He was afterwards made naval aide-de-camp to the Queen. Although the death of Lord Radstock seemed appallingly sudden to those who had seen him sitting at the General Meeting of the London University a few days before, yet others who, like myself, had watched with grief the rapid change in his health during the preceding months, were not unprepared for the sad event. Valuing Lord Radstock highly for his personal qualities, I can truly say that the death of this brave officer and excellent man created a very general feeling of real sorrow, as deep among his friends and acquaintances as in all those public bodies, and numerous charitable institutions, in the welfare of which he took a warm interest.

Robert Anderson, Surgeon, R.N., who died in June, 1856, at the early age of 38, was born in the parish of Fettercairn, Kincardineshire. Receiving his early education at the Academy of Montrose, his medical studies were carried on and completed in the University of Edinburgh. Entering the Royal Navy, as an assistant-surgeon, in 1838, he served successively in the Royal Adelaide, the Princess Charlotte flag-ship, and in the Powerful, being on board the last-mentioned ship when commanded by Sir C. Napier at the siege of Acre and during other operations on the coast of Syria. Afterwards serving upon the East India and China station in the Agincourt, Spiteful, and Dædalus, and obtaining the rank of surgeon, he again passed to the Spiteful, in which he returned from India in 1847. In the following year Mr. Anderson was appointed surgeon of H. M. S. Investigator, Captain Bird, which shared in the expedition of Sir James Clark Ross to the Arctic Seas; and in 1849, he was again selected for similar service as surgeon of H.M.S. Enterprise, Capt. Collinson, in which he continued to serve till the return of that vessel to England. With the exception of scarcely 9 months, Mr. Anderson was constantly employed afloat for a period of nearly 17 years, of which 7 were spent in Arctic service.

Besides writing extended journals, Mr. Anderson made a large collection of specimens illustrative of the natural history of Arctic regions. Of this collection the zoological specimens w deposited in the British Museum, the dried plants being sent to William Jackson Hooker at Kew, and the fossil remains to Geological Society.

Frank, generous, and warm-hearted, esteemed alike for his fessional abilities, scientific attainments, and private worth, conduct through life exemplified a high-toned sense of honour manly independence of character, and his premature death caused real sorrow to his numerous friends.

Charles ELLIOTT, Esq., who died in May, 1856, at the age of was a sagacious and esteemed Civil Servant of the East India C pany. He always strove to promote the advancement of kn ledge and geographical science, and was much beloved for social qualities. Acting in various important capacities in Hindost he eventually rose to be the senior member of the Board of Reve in Bengal, and agent to the Governor-General in the western p vinces, in which capacity he proved a worthy successor of Charles, afterwards Lord, Metcalfe.

Mr. Elliott had been, since the year 1832, a Fellow of the Ro Society, by whose members, as by our own, he was much esteeme but it is specially in the Asiatic Society, of which he had be some years the Treasurer, that his loss is most felt, as evidenced the Annual Report of that body, in which the soundness of judgment, the integrity of his character, and the discrimination his taste are justly extolled.

Lewis H. J. TONNA was a praiseworthy person, who forme serving as a purser in the Royal Navy, became Secretary of t United Service Institution, and continued to carry on the busin of our neighbouring establishment for many years with mu efficiency and most obliging manners.

W. H. PEPYS, a native of this metropolis, was born in 17 He succeeded to his father's trade in the Poultry as cutler a maker of surgical instruments. From his earliest years he voted himself zealously, disinterestedly, and uninterruptedly to t advancement of science. It is now exactly half a century sin Allen and Pepys communicated to the Royal Society the memoral experiment by which the identity of diamond with other kno forms of the element carbon was confirmed. It was, however, as t contriver of ingenious modifications of chemical apparatus, th Mr. Pepys rendered the most signal service to scientific m

During every phase of the rapid progress of chemistry, the gas-holder which bears his name, has maintained its place as well in the lecture-theatre, as in the laboratory of research. I have reason to believe that the arrangement of the magnificent voltaic battery, by which Davy decomposed the alkalies at the Royal Institution, was, more or less, confided to Mr. Pepys: hence, probably, originated the friendly regard in which he was held by that eminent philosopher. In the Philosophical Transactions for 1823 there is a description of a voltaic apparatus, consisting of two elements only, for electro-magnetic research, made under Mr. Pepys' directions for the London Institution.

Let me add that Mr. Pepys was always anxious to associate with those who, like himself, desired to cultivate science for its own sake. He joined our Society at its commencement. He was one of the early promoters of the London Institution, and an original Member of the Geological Society. He was also a Member, and an office-bearer in the Royal Institution, where he received the honour of one of the ten Gold Medals awarded for chemical discovery. He died at his house, Earl's Terrace, Kensington, August 17th, 1856, aged 81.

A Foreign Associate whose loss we have to deplore during the past year is Baron von HAMMER-PURGSTALL, the distinguished Oriental scholar, poet, and historian. Attracted from his earliest childhood towards the East and Eastern literature, no one has done more good, in spreading the knowledge of Oriental History and Literature amongst the literary circles of Western Europe, than the learned author of the 'History of the Ottoman Empire.' Born at Gratz, in Styria, in 1774, he entered the Oriental Academy at Vienna in 1788, where he attracted the attention of the celebrated Jenisch, whom he assisted in the preparation of his edition of 'Meninski's Lexicon.' He subsequently entered the Austrian diplomatic service as Interpreter at Constantinople, he then served in the same capacity to the British army during Abercrombie's campaign, and after acting as Attaché to the Austrian Embassy at Constantinople and as Consul in Moldavia, he was appointed Interpreter to the Vienna Chancery in 1811. From this time devotion to Oriental Literature became the leading object of his laborious life; and when he subsequently quitted the public service he pursued his favourite studies on his estates in Styria.

Some opinion of his active energy may be formed from the long list of works which he published,* in which great research, comb with much originality, is one of the most characteristic feat But the work which has formed the basis of his European re tion was undoubtedly his 'History of the Ottoman Empire,' b the most important work yet written on this interesting sub though even here he has been accused of an undue bias towar House of Austria; a bias, however, as pardonable as it is natu such a case.

He died at Vienna on the 16th of November, 1856, in his year. His monument, which he had himself prepared forty before his death, is placed at his own request in the cemete Weidling, near Kloster Neuburg. In a spirit of humble piet addressed a letter to our Secretary not long ago, in which, announcing the formation of a Geographical Society at Vi and presenting to this Society a copy of his last works, he add "As there is little probability that I shall be long enough in li see the end of the printing of this work, I mention the circumst that you may claim after my death the continuation of the from the Imperial Academy."

J. F. WAHLBERG, the Swedish Explorer and Naturalist, alr known for his travels in South Africa in 1843, was killed b elephant on the 6th of March, 1856, on the border of a river a 200 miles N.E. of Lake Ngami, probably the River Tamunak Livingstone. His collections have been sent to the Cape. companion Mr. Green had ascended the Tioghe as far as Lib 100 miles to the south of which he was forced to leave his boa account of the rapids.

M. Wahlberg, who was a Member of the Royal Academ Sciences of Stockholm, had returned to his native land in 1844, the indomitable desire to make new discoveries in natural his led him to revisit Southern Africa in 1854. Endowed with found knowledge in zoology and botany, M. Wahlberg, being s ally characterized by a modest and unassuming manner, was t beloved by all those who knew him, and his death at the premature age of forty-four, occasioned general sorrow throughout Sweden.

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* Amongst his numerous publications the most important are, 'Encyclo View of Oriental Science,' 1804; 'Glance at Turkish Literature,' 1816; 'Hi of Persian Belles Lettres,' 1818; 'History of the Assassins,' 1818; 'Histo the Ottoman Empire,' 1827-1834; 'History of Ottoman Poetry,' 1830-1 'The Mongols in Russia,' 1840; 'Geography of Arabia,' 1840; 'The Mo in Persia,' 1843; 'Treatise on the Seals of the Arabs, Persians, and T 1849; 'Report on Reinaud's French Translation of Abulfeda's Geography,' 'Report on Printed and Lithographic Works published at Constantinople d the Years 1845-1848.'

Lastly, let me close this enumeration of our deceased friends by alluding to our late honorary Foreign Member, Dr. Elisha Kent KANE; although no language of mine can express the deep regret I feel at the premature decease of this heroic young Arctic explorer.

The son of a distinguished Judge of Pennsylvania, he was born in 1822, and educated at the Universities of Virginia and Pennsylvania. Accompanying as a medical officer the first American Expedition to China, he explored the Philippines, chiefly on foot, and made maps of those islands. Having survived severe attacks of fever he examined the volcanic region of Java, and was the first to descend into the great crater of Tael and make a sketch of its interior. In this early effort, the zeal of the youth seemed to have no bounds, for he was lowered upwards of 700 feet by a bamboo rope, and from the effects of the strong sulphurous fumes was senseless when hauled up to the rim of the orifice. He not only traversed India and Ceylon, but also visited Egypt, where he was associated with Lepsius; but unfortunately lost his notes and papers, and being stricken with the plague, narrowly escaped death. Subsequently he sailed to the west coast of Africa, examined the slave factories, and proposed to make a journey to Abomey, which he never accomplished, owing to a violent fever, from which he suffered during his life—a fact which is not to be passed over without the comment, that his Arctic sufferings were *not* the cause of his decease; for he returned from his last perilous exploits in perfect health. His bravery, ability, and generosity were next conspicuously elicited in the Mexican war; and even then he endeavoured to find time to make barometrical observations on the height of Popocatepetl. Having volunteered his services as surgeon to the first American expedition in search of Franklin, he published a narrative of this voyage under De Haven. Finally, he performed those extraordinary researches beyond the head of Baffin Bay, which obtained for him our Gold Medal at the last anniversary and the unqualified admiration of all geographers. At that time, however, we had not perused those thrilling pages, which have since brought to our mind's eye the unparalleled combination of genius, with patient endurance and fortitude, which enabled this young American to save the lives of his associates. With what simplicity, what fervour, what eloquence, and what truth has he described the sufferings and perils from which he extricated his ice-bound crew! You must, indeed, all agree

with me, that in the whole series of literature there is no
which more feelingly developes the struggles of humanity
the most intense sufferings, or which demonstrates more striki
how the most appalling difficulties can be overcome by the
of a firm resolve with the never-failing resources of a l
intellect. In all these heart rending pages there is no p
which comes more home to the Englishmen who are still
cating the search for the relics of the Erebus and Terror,
that in which, after judging from the experience of his own
panions, how men of our lineage may be brought to bear in
cold and trail on their existence among the Esquimaux, he
soliloquises:—"My mind never realizes the complete catastr
the destruction of all Franklin's crews. I picture these to n
broken into detachments, and my mind fixes itself on one
group of some thirty, who have found the open spot of some
eddy, and under the teachings of an Esquimaux, or perhaps
of their own Greenland whalers, have set bravely to work
trapped the fox, speared the bear, and killed the seal, the wa
and the whale.—*I think of them ever with hope. I sicken not to be a*
reach them."* These generous and lofty sentiments, as I shall a
wards point out in dwelling on Lady Franklin's final search
shared by that distinguished Arctic officer, our associate Ca
Hartstene, of the United States' Navy; and they have justly awak
the hope in the breasts of many of my countrymen as well as my
that some of the fine young fellows who sailed with Franklin
still be alive—the conviction that they must, for the honou
our country, be sought for, as well as the débris and records of
Erebus and Terror.

It was, indeed, a subject of great regret to me that when
Kane visited England last autumn, this metropolis (as is usua
that season) was deserted by many of those persons who most va
his character, and that none of those attentions could then be
to him which, had his stay amongst us been prolonged, w
doubtless have been showered upon him from the Sovereign do
wards. But, alas! the stroke of death was already upon him,
when I first shook his hand, I at once saw that his ea
eye beamed forth from a wasted and all but expiring body.
geographers we were not, however, remiss in our endeavour
honour him; and although his malady prevented his attendanc
our apartments to receive our heartiest welcome, I then prop

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* Kane's Arctic Expedition, vol. i. pp. 243-6.

the Resolution expressive of our admiration of his conduct, which you passed with acclamation, and which was communicated to him personally by our lamented late President, Admiral Beechey.* Hurrying away to the Havannah to seek a milder clime, Dr. Kane there terminated his noble and brilliant career. If on the subject of Arctic research our meed of praise has justly been offered to such pure philanthropists as Grinnell and Peabody, let me say that there never has been an occasion in which the people of the United States have done greater honour to themselves than by the manner in which they sought to testify their respect for the memory of their young hero Kane, when his mortal remains reached his native city of Philadelphia. "The long procession of mourners (as is recorded in the 'Philadelphia Evening Journal' of March 12), the crowded yet silent streets through which they move, the roll of muffled drums, the booming of minute guns, the tolling of passing bells, the craped flags at half mast, and all the solemn pageantry of the scene proclaim that it is no ordinary occasion which has called forth these impressive demonstrations of public respect." Agreeing entirely with this eloquent writer, that few men have ever lived, who have earned a better title to the esteem and admiration of his race, and also warmly commending to your notice the sentiment proceeding from a great commercial city of our kinsmen, "that we are not to look to the mere *utilitarian* value of Dr. Kane's labours and adventures, to the claim for that bright and unfading glory which must ever surround his name," let me say that, by re-echoing the voice of America on this occasion, England can best cherish the memory of one who dared and did such heroic deeds to rescue our lost navigators.

Having thus imperfectly glanced at the feats which our deceased Medallist had accomplished in the short life-time of thirty-five years under the impulses of humanity and science, I cannot better sum up his virtues than in the words of the divine who preached his funeral sermon†—"He has traversed the planet in its most inaccessible places, has gathered here and there a laurel from every walk of physical research in which he strayed, has gone into the thick of perilous adventure, abstracting in the spirit of philosophy, yet seeing and loving in the spirit of poesy, has returned to invest the very story of his escape with the charms of literature and art, and dying at length in the morning of his fame, is now lamented with mingled affection and pride by his country and the world."

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* *See* Geographical Proceedings, Jan. 1856.

† The Rev. C. W. Shields.

GEOGRAPHICAL PROGRESS.

Admiralty Surveys.—The Maritime Surveys of Britain have steadily carried forward during the past year. I am info by Captain Washington, R.N., Hydrographer to the Navy, worthy successor of Admiral Sir F. Beaufort, that twenty diff surveying parties are in active service, about one-half of whic employed on our own coasts, the remainder in the Colonies Mediterranean, the River Plate, the South-western Pacific, an coast of China.

England.—To begin with operations at home. Sanitary mea connected with the metropolis have necessitated a fresh surv the upper portion of the River Thames. At the instance of the Commissioner of Works, Commanders Burstal and Cudlip, in A last, began a minute survey of the river from London Bridge upw to Putney, a distance of about 7½ miles, running again the ide lines of sections, at about 700 feet apart, taken by Giles in 182 order to institute a comparison as to the change in the bed o river. These soundings have been laid down on the sheets o Ordnance Survey of London on a scale of 60 inches to a statute a scale sufficiently large to show minutely every feature.

The result, as shown in Commander Burstal's Report and T verse Sections, is that since the year 1823 the average deepeni the bed has been about 4 feet from Putney to Westminster Bri and about 6 feet from Westminster to London Bridge; but average by no means shows the extent of the scour consequen the removal of Old London Bridge in 1832, as, for instance, nea Grosvenor Canal there are places where the deepening has 13 feet; at Westminster Bridge 10 feet; at Hungerford 11½ and above Southwark Bridge 14 feet. These figures are hi instructive, as showing the improvement which might be exp in other rivers in this country, if the old fashioned bridges w now act as dams were removed, as in the Tyne, the Slaney, an Liffey: and if Newcastle, Wexford, and Cork Bridges were re with proper openings.

The sounding of the upper part of the Thames will be conti in sections of 150 feet apart from Putney to near the Thames Tu about 1½ miles below London Bridge. At that point it has taken up by Commander Cudlip, who is now engaged soun Greenwich, Blackwall, and Woolwich Reaches, the plans of w it may be hoped, will form the foundation for a systematic an tensive dredging of all the upper part of the river so soon as the Thames Conservancy Board can be brought into action.

On the East Coast of England, Mr. E. K. Calver has revised all the charts during the past year, and inserted the changes that have taken place during the last ten years, and especially in the frequented anchorages of Yarmouth and Lowestoft Roads. He has also prepared the Sailing Directions for this coast and for the opposite shore of Belgium, Holland, and Jutland up to the Skaw, which will form Parts III. and IV. of the 'North Sea Pilot' now in preparation.

On the South Coast of England, the surveying party under Commander Cox and Messrs. Usborne and Davis have just completed a careful examination of Plymouth Sound, whence it appears that that well-known roadstead has not silted up in any appreciable degree since the breakwater was placed across its entrance—an interval of five and forty years—the first stone having been deposited in August, 1812.

In Cornwall, Captain Williams and Mr. Wells have completed the survey of the Fowey River, from Lostwithiel to the sea, and a portion of the coast from Fowey to the Dodman.

In the Bristol Channel, Commander Aldridge and Mr. Hall have surveyed Caldy and Tenby Roads, where they have discovered and mapped several new rocks and shoals not before pointed out.

Scotland.—In the Frith of Forth, Lieut. Thomas and Mr. Sutton have surveyed the coast of Haddington by Dunbar and St. Abb's Head to Coldingham, and have completed the outer soundings to the eastward of the Isle of May, which mark the approach to this extensive estuary.

Farther north, a detailed plan of the Bay and Harbour of Wick and Pulteney Town has recently been published at the Admiralty, preparatory, we trust, to the laying out of a Harbour of Refuge on that exposed coast, where in an easterly gale the 1000 herring-boats that annually fish out of Wick have no shelter to run for. The numbers of valuable lives at stake in these important fisheries imperatively demand that a suitable harbour in the most appropriate spot should be constructed without further loss of time.*

The Sailing Directions for the Orkneys and Shetland, originally drawn up by the late Commander Thomas, and revised and corrected by Mr. E. K. Calver, have been published during the past year, and they form Part I. of the four parts of the 'North Sea Pilot,' the w of which work will, we trust, be in the hands of the mariner b the close of the present year.

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* A subject of considerable importance to physical geographers as connected with the harbour of Wick will presently be discussed (*see* Physical Geography).

On the north-west coast of Scotland, Commander Wood has veyed a small portion of Skye, while Mr. Jeffery has mapped Nevis. Several detached Charts also of these coasts have published during the past year, as lochs Broom, Ewe, H Gairloch, Edrachilles Bay, including the lochs, Raasay and I Sound, Sounds of Seil, Mull, Sleat and Kyle Rhea.

In Argyleshire, Commanders Bedford and Creyke, and Mr. I chier, have added to our knowledge of the north shores of the of Mull, and have re-examined Oban bay.

In the Hebrides some soundings off the isle of Lewis have obtained by Captain Otter and his staff in the Porcupine; during the present season a survey of the Sound of Harris will, hoped, prove to the mariner whether, in case of need, he may s run for that strait.

Ireland.—On the north-eastern shore of Ireland, Messrs. Hos Aird, and Yule, have completed the examination of Belfast Harl and made patent the improvements that public spirit, combined good engineering, has within the last few years effected in port. They have also mapped a portion of the coast of Ant from Garrow Point to Ballygally Head, the fine natural harbo Lough Larne, and the artificial packet-station of Donaghadee.

In Wexford, on the south-eastern coast, Captain Frazer and L Bullock have re-examined the channels and banks at the entran that harbour, where some remarkable changes have taken place, made a detailed survey of the River Slaney up to the town of E corthy, preparatory, we trust, to some extensive improvements i channel—a measure which could not fail to be attended with c sponding benefit to the fertile country which that river drains.

In Donegal, on the north-west coast, Captain Bedford and L Horner have completed elaborate plans of Sheep Haven and Mul Bay. By permission of the Admiralty, these plans have been hibited at our evening meetings, and I am sure you will all willi join with me in acknowledging the apparent fidelity and beauty which the features of these natural inlets have been portrayed.

In Kerry, on the south western coast, Commanders Beechey Edye, with Mr. W. B. Calver, have mapped a portion of Tralee Brandon bays, while Mr. McDougall has surveyed Dingle and Ve harbours, which lie on the southern side of the same bold proje peninsula of Kerry, and which, having twice examined myself, I can testify to be the most interesting part of Ireland, in showing certain relations of the Silurian to the Devonian rocks, which can nowhere else be seen in the sister island.

The neighbourhood of this immediate coast, on the south side of Dingle Bay, is about to become a site of much interest and importance, the small island of Valentia having been selected as the Eastern or European terminus of that Atlantic Electric Telegraph Cable, on which I shall presently enlarge, as destined to unite the two continents in stricter bonds of amity and good fellowship.

It must interest my hearers to know that Lieut. Dayman, R.N., who was a companion of Sir James Ross in his voyage to the Antarctic regions, will leave England in a few days in command of the Cyclops steamer, to carry a line of deep sea soundings across the Atlantic, from Valentia to Trinity Bay in Newfoundland. The vessel is furnished with some 20,000 fathoms of line of different sizes, a portion being of silk, with an abundant supply of sounding machines, and a steam-engine on deck on purpose to heave in and reel up the line, and we may fairly hope, ere long, to have a second continuous line of soundings across the Atlantic, and know the nature of the bed on which the Telegraph Cable will have to repose.

With the authority of our Council, I took advantage of the announcement of this expedition, so deeply interesting to naturalists, and suggested to the Hydrographer that, the opportunity being one which might never recur of obtaining an accurate acquaintance with submarine life at great depths, a competent naturalist might be allowed to accompany the survey, or that in any case the medical officer of the Cyclops might be so instructed as to record accurately the phenomena.

Black Sea.—In quitting our home for foreign shores, the survey of the Delta of the Danube claims precedence, and is entitled, in the opinion of my eminent friend Captain Washington, to our warmest acknowledgments for the admirable manner in which it has been carried out by Lieut. Wilkinson, R.N., under the orders of Captain Spratt, R.N., C.B., whose report on Fidonisi, or Serpent Island, has been communicated to the Society by the Admiralty. This recent survey of the streams which form the delta of the Danube is comprised in several charts, filled almost to overflowing with soundings of the three principal branches, Ochákov or Kilia to the north, the Súlina in the centre, and the St. George or Khedriliz to the south. These plans are now lying on the table before us, and they bespeak for themselves our admiration of the beauty of execution and of the unflinching perseverance with which t services were accomplished in the short period of a few mont last autumn.

Sea of Azov.—During the present session, we have received our associate, Captain Sherard Osborn, R.N. (so honourably k to us by his Arctic explorations and writings), an interesting munication on the geography of the Sea of Azov, the Putrid and the adjacent coasts, with remarks on their commercial cap ties. As the hydrographical features of this area are pecul deserving of notice, I naturally treat of them under the head o British Naval Surveys. In no part deeper than 40 feet, the c of this sea forms a flat basin 55 miles in extent from east to and 35 from north to south, with an inclination from the ed this level to the coast of about a foot per mile, increasing s what in abruptness as the water shallows.

The sandy spits, which are so remarkable, and are attribute the author to volcanic action, afford a shelter against easterly w but there is no protection in any part of the sea against t from the west. When this communication was read, I confi from personal observation, the accuracy of Captain Osborn's marks upon the rapid accumulation of sand on these spits; the fact of their being precipitous on the east side and shel on the west is a good addition to our knowledge. There ca no doubt, however, that the base of some of them, near the p consists of knolls formed by the discharge of ballast from trad vessels, thus forming nuclei for fresh alluvial deposits, which, a short time, become connected together; and unless mean adopted for checking this system of accumulation, the Sea before long, be hardly navigable in certain places.

The assertion of M. Taitbout de Marigny, that there is little rent in the Sea of Azov, is shown by Captain Osborn to be an er the existence of currents being indicated, not only by the i ence of the winds on the motion of the water, but also b plainly manifested by the outflow from the delta of the Don, Sivash, and the rivers between Taman and Kamisheva. The sical features of the Spit of Arabat, and of the Sivash or P Sea, are described from observations made, under very diff circumstances, during the late war.

Mediterranean and Archipelago.—On a recent route from Malt the Dardanelles, Captain Spratt had an opportunity of obtaini line of deep sea soundings between that island and Candia, in which the greatest depth was 2170 fathoms. The section is very striking; for a distance of 50 miles to the eastward of Malta the depth does not exceed 100 fathoms, after which it drops almost suddenly to 1500 and 2000 fathoms, and continues near that level *below* the surface of the sea until within 20 miles of the east end of Candia or Crete, where the White Mountains and Mount Ida rise up to a nearly equal height *above* the level of the sea. Between Crete and the Dardanelles the greatest depth is 1110 fathoms.

Africa.—On the North Coast of Egypt, Commander Mansell in the Tartarus, with his assistants, Lieut. Brooker and Mr. Skead, have completed a survey of the coast from Damietta eastward to El Araish, an admirable plan of the port of Alexandria, and a survey of the bay of Suez, a place daily becoming of more importance as our direct mail communication extends to India, China, and Australia.

Taking advantage of fine weather and a calm sea, Captain Mansell has lately run a line of soundings between Alexandria and the island of Rhodes. From the coast of Egypt the depths gradually increase until at 70 miles off they reach 1000 fathoms, at 110 miles 1600 fathoms, which is the maximum depth of this portion of the basin of the Levant. The above soundings are of great interest to the geologist as well as the geographer, and do much credit to the officers who, overcoming many difficulties, have succeeded in carrying them out.

While on this subject I should mention that, in October 1856, Messrs. Delamanche and Ploix, Ingénieurs Hydrographes of the French Imperial Marine, carried a line of soundings across the Mediterranean between Port Vendres in France to Algiers, in which the greatest depth was about the same as in the Levant, namely 1600 fathoms.

South Africa.—In the Cape Colony the only addition we have to record is the completion by Mr. Francis Skead of the survey of Port Natal, begun by Lieut. Dayman, R.N., in 1855. I cannot here but repeat the words of my predecessor in this Chair, that both the land survey of the colony and that of the coasts ought to be pressed forward. Every year that they are delayed bars the progress of the settlers, hinders the development of the resources of the district, and is attended with loss to the colonial exchequer.

China Seas.—In the last anniversary Address a hope was expressed that Captain Bate, the surveyor of the island of Paláwan, might be more usefully employed in China than in merely commanding a cruizing ship. It is gratifying to be able to state, that a thoron equipped surveying vessel, the Actæon, accompanied by a steam tender the Dove, under command of Lieut. Bullock sailed for those seas, and as soon as the present unfortunate d ences with China are settled, Captain Bate will resume his su on such parts of the coast as most require it. In the mean Messrs. Richards and Inskip in the Saracen will proceed f with to make a detailed survey of the dangerous shoal *As* (lying only 60 leagues to the E.S.E. of our own colony at Kong), with a view to the construction of a lighthouse upon extensive coral reef which has caused the wreck of so many ve

Siam.—The chart of the Gulf of Siam has been materially impr during the past year. Messrs. Richards and Inskip have vi Bangkok, where they experienced great attention and assist from the enlightened ruler of that country: they have rectifie positions of several islands and of many of the headlands and on the western as well as on the eastern shore of the gulf.

Tartary.—Farther north on the coast of Tartary the officers o of our cruizing vessels, the Barracouta, have examined a har which they have named after that ship, and in which the Ru frigate Pallas had taken refuge. This capacious harbour is same as that called Imperadorski Gavan, or Port Imperial, by Russians, and lies about 130 miles south of Castries Bay.

In the Admiralty chart of these regions the whole course o Amúr has been laid down from the astronomical observations by Peschurof in 1855, which render the river quite a new featu our maps. The details of these observations are given in 'Morskoi Sbornik,' or Russian Nautical Magazine, for March May, 1857. They are also to be found in that excellent geograp periodical, 'Mittheilungen,' edited by Dr. A. Petermann at Got

New Zealand.—The publication of the detailed charts of the c and harbours of this group of islands advances rapidly; the year has produced four coast charts, on the scale of 4 miles t inch, and 11 plans of harbours and rivers, including Auckl Waitemata, Taupanaa, Whangaroa, Hokianga, &c., being a po of the ten years' labour of Captains Stokes and Drury, with Me G. Richards, Frederick J. O. Evans, J. H. Kerr, &c., and trust that before the close of the next year every item of i mation we possess of these islands will be in the hands of mariner.

Pacific Ocean.—Captain Denham in the Herald continues useful labours in the south-western Pacific. During the past year he has surveyed several islands of the Fiji group, as Angau, Matuka, Mbatiki, Moala, and has swept from the charts the imaginary Underwood and Rosaretta reefs. Assistant-Surgeon Macdonald of the Herald has made a journey into the interior of the island *Viti Levu*, which, with a track chart of the route, has been communicated to the Society by the Admiralty. Various views of headlands and characteristic sketches of the scenery and of the natives have been made by Mr. Glen Wilson, artist to the expedition.

A chart of the Pacific Ocean, in 12 sheets, on the scale of $\frac{5}{10}$ths of an inch to a degree, has recently been published by the Admiralty, in which the curves of equal variation have been carefully laid down for the year 1855, by Mr. Frederick J. O. Evans, chief of the Compass Observatory. The whole forms a valuable contribution to hydrography, and physical geography.

America.—Pursuing our imaginary eastern route, we have the gratification to announce that a well organized expedition, under the command of Captain George Richards, R.N., favourably known as a fellow-labourer with Captain Stokes in the survey of New Zealand, has sailed for Vancouver Island, to determine, in conjunction with the United States Commissioners, the boundary, as laid down by treaty, between the British and American possessions. This expedition cannot but be productive of a good harvest of geographical information.

In the Rio de la Plata, Lieut. Sidney, with slight means at his command, has fixed the position of the north edge of the English Bank, lying some 10 miles south of Monte Video; he has completed a detailed plan of the river and outer roadstead of Buenos Ayres, and has partially examined the lower course of the Uruguay.

On the coast of Brazil, Lieut. Parish, R.N., has furnished plans of several small harbours and otherwise improved our charts, while a more complete Sailing Directory, founded on the labours of Baron Roussin, is in course of preparation by Rear-Admiral FitzRoy.

West Indies.—The additions to geography in the West Indies consist in a survey of the island of Santa Cruz, and the harbour of Christianstadt, by Messrs. Parsons and Dillon; a re-examination of the harbour of Grey Town by Mr. Scott, master of H.M.S. Impérieuse, and some new coral patches discovered among the Pearl Cays.

Nova Scotia.—In the Bay of Fundy, Commander Shortland, with Lieut. Scott and Mr. Scarnell, has completed the soundings in the vicinity of the Grand Manan islands at the entrance of the Bay, has mapped a further portion of the south-western coast of Scotia.

Gulf of St. Lawrence.—Rear-Admiral Bayfield, in succeedin his flag, retires from the command of the survey of the Gulf River St. Lawrence, on which extensive work he has been eng upwards of a quarter of a century. It has fallen to the lot o officers to originate and bring to a close, after so many yea extended and laborious a work, where the Surveyor had to con with a rigorous climate in winter and fogs in the spring and aut leaving but a short season in which outdoor work could be exec It has, however, been done in a masterly manner, as more than published charts and plans, complete sailing directions, a valuable table of Geographical Positions connected with Qu Halifax, and Boston, most fully testify. I am sure you will all cordially with me in wishing many years of honourable repos the gallant Admiral whose labours have bestowed so valuab boon on the mariner, and whose previous observations, let me on various glacial phenomena, including the transport of block the ices of the St. Lawrence, have been of signal service to g gical science.

Commander Orlebar, the former chief assistant, succeeds to charge of the survey, which will be continued along the eas shores of the peninsula of Nova Scotia.

Ordnance Survey of Great Britain.—No change, as I am infor by the able superintendent of the Ordnance Map Office, Li Colonel James, has been made in the orders relative to the su during the last year, and the progress in the north of England Scotland for the twelve months ending on the 31st of March been very great, amounting to 1,394,409 acres, finished in e respect for publication.

The publication of the following counties has been finished wi the last year, viz. Yorkshire, Fifeshire, Kinross, and Linlithgowsl

The publication of the following counties is in progress, Durham, Ayrshire, Dumfriesshire, Renfrewshire, and Berwicksl

The survey of the following counties has been finished during last year, viz. Berwickshire and Selkirkshire (nearly).

The Survey is in progress in the following counties- North berland, Westmoreland, Lanarkshire, Roxburghshire, Forfarsl and Perthshire.

The surveys of the large towns of Glasgow and Dundee and many others have also been finished in the last year.

An outline map of London, on the scale of 6 inches to a mile, has also been made within the last few months. The one-inch map proceeds *pari passu* with the maps on the larger scale, and great advantage is derived from the system of making all the reductions from the larger to the smaller scales by the aid of photography; indeed, Lieut.-Colonel James expects to be able to get the ground sketched on the 6-inch impressions in such a way that, when reduced by photography, the reduced drawing will be the fac-simile of what the engraver is to produce.

The general reduction in the estimates of the War Department consequent upon the return of peace, has led to the reduction of the proposed grant for the survey for the present year to the extent of 27,000*l.*, and, as a consequence, the surveying force has been reduced to the extent of 3 officers and 600 men, the parties destined for the surveys of Cumberland, Stirlingshire, and the Western Hebrides, having been broken up.

Geological Survey of the United Kingdom.—Having directed the Geological Survey of the United Kingdom during the last two years, it becomes me to say a few words on the progress of a branch of the public service so intimately connected with geographical science. The first object contemplated by my predecessor, Sir Henry de la Beche, in founding this establishment, was so to colour the Ordnance or Geographical Maps as to convey a clear idea of the rocks beneath the surface in all parts of the kingdom, and further to illustrate such structural character by coloured sections, both vertical and horizontal. In this way, not only the order and succession of the strata are delineated, but the dislocations they have undergone are marked; whilst all the rocks of igneous origin which had been intruded among them are clearly defined.

As the work advanced, it became desirable, that these surveys and sections should be accompanied by volumes explanatory of the nature of the rocks, and their mineral and zoological distinctions, with descriptions and figures of the imbedded organic remains. To render the whole subject intelligible, it further became requisite so to expose the fossils collected by the surveyors, that the public might be led to understand the *rationale* upon which the maps, sections, and descriptions were founded. Thus, a

Museum having been established on a small scale in C Court, with an attached experimental chemist and labor it was decided by Sir Robert Peel, at the suggestion (lamented predecessor, that the whole establishment should larged and placed on a footing similar to that on which conti countries sustain such mineral and geological surveys. Then the Museum in Jermyn-street, which, from its origin, was const to be not only the central Map Office of the Geological Survey, the fieldwork of the surveyors is laid down, compared, and iss the public, but also a place where the proofs of the accuracy o works might be accessible to every one. Collocating in it mens of the building stones, marbles, granites, &c., of variou tricts, this museum was rendered still more useful by the addit a Mining Record Office, in which plans of all the mines, abandon existing, are, as far as practicable, registered and kept, and va statistical documents brought together to show the whole mi produce of the country. Lastly, to attain the same position occupied by the mining schools of France, Germany, and countries, it was resolved to constitute within the new buildi regular School of Mines, and to carry out in it (which had nov been previously attempted in Britain) a complete course o struction in those physical sciences on which geology is based. eminence of the gentlemen with whom I am associated in Jer street, is the best guarantee for the success of an establish in which youths can be thoroughly and systematically instruct physics, mechanics, chemistry, metallurgy, mineralogy, mining geology.

My hearers will therefore understand, that the Jermyn-s establishment, having for its basis the geological and mineral i tration of the British isles, performs, at the same time, all the c duties to which brief allusion is here made, and must be viewe a truly useful national undertaking.

The maps, which have been completed and published on 1-inch scale with 6-inch horizontal sections, relate to the who Wales, all the south-western districts, and a great portion of central counties of England; whilst vast tracts in Ireland been surveyed and the information registered on maps of the 6- scale, and four counties published on the new 1-inch maps.

In Scotland also, progress has been made commensurate with present force of surveyors, and there, as in Ireland, the data registered on the maps of the 6-inch scale, so as to be ready to be published, when the maps of the districts under review shall have been completed.

I have great satisfaction in informing you that, as the Geological Survey proceeds, the public is rapidly becoming aware of its value. The sale of the maps and sections has recently been doubled; so that, if the present demand should continue, the sale of this year will exceed 5000 sheets.

As no men of science are more directly concerned with the successful progress of the Ordnance Survey of the country, than the geologists who have to work out the subterranean phenomena upon the geographical features there laid down, so it may naturally be expected, that I should express my opinion on the *questio vexata* which has been so much agitated in Parliament, viz. the best scale for publication.

Most persons will agree with me in what I have long contended for, that a 1-inch scale* is large enough for the purposes of a general map, and any one who doubts it should visit the Museum in Jermyn-street, and there see how vast a portion of a lofty hall is required to exhibit at one view that portion only which is geologically finished, or Wales and the half of England. But, whilst for the general purposes of the public, this scale (which is larger than that of the *published* maps of France and other foreign countries) is quite sufficient, it is my duty to say, that for several objects of the geological surveyor the 6-inch map is often of higher value. This latter scale was applied to Ireland, because it was supposed to be the smallest measure on which every essential feature of a tract, whether natural or artificial, could be laid down. It follows therefore that, in availing himself of this map, the field geologist has at hand a datum-point for every observation; particularly if it be furnished with contour lines marking the relative altitudes. In short, he can register, with an accuracy unattainable, except on such a scale, every outcrop, fold, or break of the beds; and hence, independently of the advancement of the theoretical branches of subject, and the acquirement of a sound knowledge of the s strata, he can essentially serve the purposes of the mining] prietor.

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* *See* Memorial resulting from a resolution which I moved at the fourth or Edinburgh Meeting of the British Association for the Advancement of Science (1834) and presented to the Chancellor of the Exchequer (now Lord Monteagle) in May, 1835. Report of the British Association, Proceedings of the Meeting, p. xxxvi. This document, which showed the deplorable state of the Geography of my native country at that time, was also printed by order of the House of Commons. Subsequently, when President of this Society in 1853, I again made a strong appeal touching the neglect of Scottish Geography.—Journal of the Royal Geog. Soc., Vol. XXIII., President's Address, p. lxxxix.

Having always held (as I still hold) that the 1-inch map is publication which the country most requires, I am bound to re that my conviction of the utility of the 6-inch scale, for certain logical and mining purposes, is the result of an examination of able surveys conducted on maps of that size under the guidanc Mr. J. Beete Jukes in Ireland and of Professor Ramsay in Scotl I trust, therefore, that this larger scale will be maintained ordinately with the smaller one.*

PHYSICAL GEOGRAPHY.

Observations on the Summit of the Peak of Teneriffe.—Having sp of the progress of practical geography at home and in our dis Naval Surveys, it becomes my agreeable duty to notice the uncom British expedition proposed and executed last year by Profe Piazzi Smyth, Astronomer-Royal for Scotland. During the five years this zealous observer had endeavoured to impress u Government, founded on his experience at the Cape of Good H the eligibility of rising above the grosser stratum of our atmosph and had pointed to the facilities offered by the Peak of Teneriffe

The Admiralty having finally listened to his arguments, acceded to his moderate estimate of expense, Mr. H. Pattinso Newcastle-on-Tyne added a powerful telescope to his instrume and our associate Mr. Robert Stephenson, generously lent him yacht for the whole voyage out from Southampton and home; wl several leading scientific men were glad to have their favo experiments tried in so novel a position.

The Professor established his first station on the Peak of T riffe, from the 14th of July to the 20th of August, amid the trachytic lavas of the volcano, on a spot called Guajara, 8843 the sea. Here, above all the clouds, except a few scirri, ppeared about one day in five, he mounted the five-feet hanks equatorial, which revealed test objects of three magni- smaller than it had ever shown before. In the apparatus ed by Prof. Stokes, the increase of black lines was remarkable sun's zenith distance increased, and there was a growth of d end of the spectrum. The dryness was so great, that while untry below was covered by a dense bed of clouds, the ave- of the dew point was 40°. The sun's radiation exceeded the ation of the instruments, the temperature reading 180° + x. moon's radiation became perfectly sensible to Mr. Gassiot's mo-multiplier, showing it to amount to one-third of the heat of ndle at the distance of 15 feet.

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* I say nothing here of the Survey on the 25-inch scale which is in progr the richer tracts of Scotland and the north of England, because it contai delineation of the natural features of the ground. Such surveys are not viewed as *Maps*, but simply as cadastral plans, which many eminent public consider to be of the highest value for the conveyance and settlement of prop &c. They are also highly useful as Fortification Plans, and for *all such pu of detail* they are, in my opinion, preferable to any smaller surveys.

he second station was at Alta Vista, 10,710 feet above the sea; there the twelve feet Pattinson equatorial was finally mounted, by its space-penetrating power, stars of the sixteenth magnitude e easily seen, and the fractions of a second in the distance of ble stars were defined. The colour also was observed. Only one occasion could red prominences in the sun be suspected. ny other branches of observation were included, and minutely ported to the Admiralty. The breaking up of the season, after e middle of September, rendered a hasty retreat necessary, but ith the conviction of a yet higher station being desirable in future, only to get above the persecuting dust, a convenient site was marked at the height of 11,700 feet above the sea, still accessible to mules, if a little money were spent in removing some rugged blocks of lava.

Specific Gravity of Sea-water.—Our attention was recently called to the condition of the sea-water on the West Coast of Africa, when it was rendered more or less turbid to the distance of many miles from the mouth of the great river Congo or Zaire. Dr. James Campbell, F.R.G.S., of H. M. ship Plumper, observing this phenomenon, had the precaution to collect and send home, with a notice, various samples of sea-water taken at various distances from the shore, noting the day of collection, the latitude and longitude, and the temperature of the water and air at each of these spots. It became therefore a subject of interest to determine, if possible, the nature of the discolouring matter, and the relative specific gravity of the water in the different localities. Mr. Henry M. Witt, of the Government School of Mines, has had the goodness to examine, at my request, these samples of water, and his account of them will be published i our next Volume. Unluckily the quantities of the water sent home were far too small to admit of rigid chemical analysis. Thus, in regard to the discolouring matter, it could only be ascertained, that it was a suspended, light, yellowish, flocculent substance, which affected the usual green colour of the sea, and is in all probability of organic (vegetable?) origin. The specific gravity, however, of the water has been determined, and the result, as will be shown in a table, confirms the observations of Mulder and Dr. John Davy, of a diminution of such gravity in sea-water as it approaches the mouths of rivers. Mr. Witt further mentions the results of other observers, and states, that after a series of experiments, in a voyage from Southampton to Bombay, MM. Adolf and Hermann Schlagintweit give 1·0277 as the mean specific gravity of the Atlantic; whilst our late member, Admiral Philip King, found the mean specific gravity of the Pacific to be 1·02648 between 10° and 40° s. lat., and 1·02613 between 40° and 60° s. lat. It would, therefore, appear probable, that whilst the density of inland seas, such as the Mediterranean, is higher than that of the broad oceans, the Atlantic will be found to have a higher specific gravity than the Pacific—a point, however, which ought to be ascertained accurately by numerous determinations of the quantity of saline matter in the waters of each of these oceans.—(*See* Smyth's 'Mediterranean,' p. 131.)

Permanent Effects of Winds and Currents.—By perseveringly observing the phenomena attendant upon the wear and tear of the coast of Caithness, and by pondering upon the changes that have taken place in and about the harbour of Wick, Mr. John Cleghorn, of that town, after pointing out that the south-west side of the harbour was comparatively shallow and its north-east deep, extended this observation, and found it to be true as respected other bays of the east coast of Scotland. The same observer, who had previously roused attention to the ruinous effects of the present system of fishing, in destroying the breed of herrings, and who has also written an able notice upon the formation of rock basins by the action of waves upon large stones (both derived from his own examination), was, in this case, led to believe that the natural cause affecting Wick harbour has been the long-continued prevalence of the south-west wind, which produced waves that had worn away the north-eastern headlands into precipices, and had sent back the débris by a counter or reflux current, which necessarily tended to shoal up the opposite or south-western side of the bay.

Consulting Mr. A. Keith Johnston, of Edinburgh, who had devoted many years to the accumulation of such data, Mr. Cleghorn found that his view of the prevailing south-west wind was correct, as respected all the region of the globe north of N. lat. 30°; and hence he is naturally disposed to generalize the application of facts which are not only curious, but of value to the practical civil engineer.

An acquaintance with these data may, indeed, stimulate physical geographers to look into the general effects which have resulted from the continuance during a very long period of the same great dynamic force. In the mean time much inquiry seems to be called for. Mr. Findlay, to whom we are so much indebted for a perspicuous collection of all observations on tides and currents, whilst agreeing to the chief datum of Mr. Cleghorn, that the north-eastern shore ought, in our latitudes, to be the deepest, and the south-west shore the shallower, as due to the south-west wind governing the direction of waves which frequently have their origin at a distance of 1000 to 1800 miles from their effects, is not yet convinced of the truth of the other portion of the inference of Mr. Cleghorn, that the débris of the worn side is translated by a counter current towards the south-west. He reminds me, in a letter to myself, that the two circulating tidal systems, demonstrated by Dr. Whewell to exist in the North Sea, seem to explain the drift of silt from the extreme eastern shores of Britain to the Goodwin Sands and the Flemish Banks; whilst the débris abstracted from the south-west coast finds its way to the heads of the flow-beds in Morecambe Bay and the Straits of Dover, as shown by the tidal diagrams of Admiral Beechey.

As there is evidently conflicting evidence on this obscure part of the subject, and as the "Flot du Fond" of M. Emy * has been much disputed (M. Givry contending that wind affects the sea to no greater a depth than 10 fathoms, whilst Captain M. White extends that influence to 60 or 70 fathoms), we see how much additional observation is required before we can definitely judge the question with precision. If, by the examination of many other localities, the views of Mr. Cleghorn should be sustained, the generalization will be essentially serviceable in its practical application, and we may then be able to define the origin and progress of many large collections of drifted and alluvial matter, whether accumulated in

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* Du Mouvement des Eaux, &c. Par le Colonel A. R. Emy. Paris, 1831.

remote periods, or now in progress. Once let the two points c simple view be established, and we may extend the reasoni those periods of change in the surface of the globe when, aft former sea-bottoms were raised up to constitute the mass c present continents, great lines of cliff were formed in given tions, facing, as it were, broad, low tracts, covered by m drift.

"How is it," said a native of the country to me, when formerly travelling in Russia, "that the Volga has always its bank lofty and precipitous, and its left bank low?" The que was startling; but, in examining the rocks of the mightie European streams, I found that it was true, though the cou the stream varied more than the fourth of a circle in the main directions which it followed. Descending along the hi right bank from Nijny Novogorod to Kazan, I did, indeed, spec upon its having been the ancient shore of a sea which covere lower country to the north; and if we adopt the law that the cipitous face was the side exposed to the waves, the prev wind in that region, at a period antecedent to the creation c human race, must have proceeded from the north.

This phenomenon, of a precipitous face exposed to the north, tinues from the confluence of the Oka and Volga on the wes Kazan on the east, a distance of upwards of 200 miles. Throug that space, headlands of red sandstone and marls stand out o right bank, opposed, in a striking manner, to the low countr the left or northern shore. Again, whilst not a single nort erratic block is to be found to the south of this portion of the V the low country, at a little distance to the north, is covered by t great erratics, all of which, as geologists know, were transp by ice-floes from the north, and dropped upon the bottom former sea. We may, therefore, naturally infer, that this east west line of cliffs was formed during the icy period, when the northern currents prevailed, the waves of which lashed agains hills extending from Nijny Novogorod by Tcheboksar and S to Kazan.

On the other hand, when the same great stream turns abru to the S., and trends even to the S.S.W., a line of cliffs, still o right bank, ranges from the bold headland of Carboniferous L stone near Samara, and extends for about 550 miles to near Tzari facing the E.S.E. and S.E. Now, it is to be noted that, in t of this line of cliff, the low country on the opposite bank of stream was unquestionably occupied, at a very modern date, by a great internal sea, the desiccated shells of which, now lying on the steppes, are of the same species as those still living in the Caspian.

In these dried-up bottoms of a vaster Caspian, or what I termed "Aralo-Caspian,"[*] the erratic blocks of the north are no longer to be seen, and we are in a region where the right bank of the Volga has been fashioned into cliffs by the agency of winds and currents proceeding from a point of the compass very different indeed from that whence the winds and waves proceeded, when the cliffs ranging from Nijny to Kazan were formed.

In thus cautiously reasoning from data which are absolutely in our possession, and by extending the application of existing causes, we may be capable of determining the direction of the prevailing winds in different epochs of the earth's formation, and even in very remote geological periods; for many of the escarpments of ancient stratified rocks have doubtless had their prevalent direction of cliffs formed by the breakers and atmospheric agency of by-gone periods.[†]

Again, as we know that the ripples on the surface of the sands of the present shores indicate the direction of the waves, so when a sufficient number of observations shall have been made by Mr. Sorby and others[‡] upon the ripple-marks which have been preserved in the successive surfaces of stone, we shall be enabled to infer the direction in which the prevailing winds blew during each former geological period!

But I am now, perhaps, realizing too demonstratively for all my hearers, the truth of the incontrovertible axiom, that physical geography and geology are inseparable scientific twins.

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[*] *See* 'Russia in Europe and the Ural Mountains,' p. 299, and the Geological Map, on which are noted the two points here contrasted, viz.—the southern range of the northern erratic blocks and the western boundary of the Aralo-Caspian Deposit.

[†] *See* the account of the formation of the '*Straits of Malvern*,' in Murchison's 'Silurian System,' p. 530; and consult Professor Ramsay's writings on this point in his 'Memoir on the Denudation of England and Wales,' 'Memoirs of the Geological Survey of England and Wales,' vol. i. p. 333.

[‡] *See* 'Edinburgh Phil. Mag.,' New Series, vol. iii., p. 112, 1856. Mr. Sorby has particularly distinguished himself by his numerous observations on this subject, and has also explained his views by ingeniously contrived instruments of his own invention.

USEFUL INVENTIONS.

The Atlantic Telegraph.—At the head of the list of useful inven in the course of application, must unquestionably be placed Great Atlantic Electric Telegraph.

The series of nautical observations recommended for statis purposes, in reference to the meteorology and physical geogr of the sea, by the Maritime Congress held in Brussels in 1 followed by the co-operation therein of the mercantile and gov mental navies of the countries there represented; the subseq writings and investigations of Lieut. Maury, U.S.N., founded lar upon those observations, and the soundings of Lieut. Berryman others in the Atlantic Ocean, have determined the path w seems at present to be the only practicable one for successi submerging a telegraphic cable beneath that sea, and so uni Britain and America.

This path would appear to lie, in a straight line, nearly due and west, between 48° and 55° N. latitude from the coast of land to that of Newfoundland, along the course of which the d of water is believed to be nowhere greater than 12,000 The depth descends in gradual inclinations to that maximum, from sudden chasms or subaqueous promontories; and upon a pla at the bottom of the sea there is formed an agglomeration by constant current of the Gulf stream, which proves, under mi scopic observation, to be composed of the minute shells of F miniferæ and Diatomaceæ, and which, it is believed, will, in t form a complete incrustation over the outer metal of the telegra cable.

It is singular that in no other part of the Atlantic than ac this broad belt do conditions exist which, according to our pre knowledge, would justify an attempt involving so much scien interest, and so large a cost, as that of such a submergenc telegraphic wires.

To the southward of the Great Bank of Newfoundland, the bot of the ocean suddenly recedes into vast and uncertain depths, to some great former depression of the earth's crust, in many pl unfathomed, which leave a channel for the Gulf-stream, along whole of its course to the northward of the Gulf of Mexico. Th depths continue, with intervals of abrupt and almost precipi breaks of elevation and depression, for half the distance eastward from the seaboard of the United States towards the coast of Portugal, and for as great a length in a north-easterly direction towards the coasts of England and Ireland. They are succeeded, in a direction due east, by the region of the Azores, where submarine volcanic action is constant, and where, owing to the deep soundings inshore and the absence of suitable bays or coasts in those islands, the secure landing and subsequent maintenance of the telegraphic cable would be very difficult and problematical.

With regard to the distance, it may be mentioned that a line from the nearest point on the coast of the United States, if taken direct, without touching at the Azores, would consume nearly 4000 miles of cable, and absorb considerably more than half a million of capital, and, that when laid, it would, in all probability, be soon abraded and destroyed, owing to the many and deep valleys it would necessarily have to bridge over along its course; while its great length would increase the difficulties and delay experienced in transmitting a current of electricity through very long circuits. Moreover, if carried by way of the Azores, using one of the islands as a relay station, the physical inequalities of the bed of the ocean would in no way be lessened in the western part of that route, and it would have the disadvantage of passing over a broader submarine volcanic region.

North of the coast of Newfoundland and Labrador, great difficulties also obviously present themselves. Vast masses of floating ice would, at all times, render the operation of laying a cable a most difficult, if not an impossible, undertaking, and even if landed, it would be liable to perpetual abrasion. The long and dreary tract of inhospitable country that would have to be traversed by land-wires, to complete its connection with the civilised portions of the American continent, would alone be sufficient to prevent its adoption.

These then are the considerations which led to the adoption of the route for laying the telegraphic wires across the Atlantic.

We now come to the means by which the electric current is to be transmitted. It is quite obvious that the great bulk and enormous weight of all previously manufactured submarine cables would preclude their use for a distance so great as that to which, it is hoped, the Atlantic Company are about to extend a successful operation. A form of cable had therefore to be devised, which should combine a maximum of strength with a minimum of weight, great flexibility with sufficient rigidity to allow of its being laid in a straight line, a capacity of tension if needful to a moderate extent without ir with cohesion sufficient to ensure resistance to a strain of con able amount.

In the form of cable adopted by the Company,* it is believec all these conditions are fulfilled. The conducting medium is fc by a strand of seven copper wires; six of these wires are w spirally round the seventh, which latter is laid straight th the centre, and the diameter of the entire strand is somewha than the eighth of an inch. Around this strand are placed separate layers of gutta percha, and thus the "core" is fo which is about three eighths of an inch in diameter. Upon the the appliances for sinking it and providing against the strai abrasion incident to the paying it out into the Atlantic are These consist of a soft bed of hempen twist saturated with which is wound round the gutta percha core, and on the exter this is spun, in spiral continuity, eighteen strands of iron This operation completes the cable, the total diameter of wh five-eighths of an inch, and the total length 2500 miles, or ab third of the earth's diameter. The total continuous length o copper and iron wire employed in its manufacture will be 33 miles, and if extended in one line would therefore go fourteen t round our little planet.

The form of apparatus with which it is proposed to projec electric current through a conductor of such enormous length also been specially adapted for the purpose.

The connection of Great Britain with America by the means delineated will, it is trusted, be realized by the end of Augu the present year. The magnificent United States' frigate Nia commanded by Captain Hudson, will ship her portion of the c consisting of 1500 tons, at Liverpool, and H. M. ship Aga non, under Master-Commander T. A. Noddall, will receiv equal amount off East Greenwich. They will then procee mid-ocean, when they will commence paying out the cable, Niagara steaming towards the coast of America, and the memnon returning to England. The Agamemnon has been ceded by the paddle-wheel steam-frigate Cyclops, for the pur of taking soundings; and steps have been taken by the Admi to secure for naturalists all the materials whether animal or v table which may be brought up from the sea bottom. Le then wish every success to this gigantic project, by which, combining the discoveries of Wheatstone with the ingenious contrivances of Morse and Whitehouse, the Anglo-Saxon race is determined to show, that not the broad or deep ocean can really separate the two great families of the same race and lineage.

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* I am indebted to Mr. T. Holdsworth Brooking, F.R.G.S., for these details. Bright is the able engineer of the Atlantic Telegraph Company.

Free-Revolver Stand.—A most ingenious invention, and one which must prove of great use to seamen, having been made by Mr. Piazzi Smyth, was recently tested by that skilful astronomer in his outward voyage to examine the natural phenomena on the Peak of Teneriffe, which has just been alluded to. This trial demonstrated the entire efficacy of his newly mounted "Revolver stand for steadying a telescope at sea."

Notwithstanding the excessive rolling and pitching of the vessel, he kept the sea horizon in one unvarying position in the field of the telescope long enough for several persons to observe it in succession. The only addition required was a remedy for the third element of motion, arising from the azimuthal *yawing* of the ship's head, and this his mind immediately suggested to him for consideration during a subsequent voyage.

New Geometrical Projection of two-thirds of a Sphere.—Our associate Colonel James, the Superintendent of the Map Office, has presented to us a copy of his new geometrical projection of a sphere, and in an accompanying letter has explained the manner in which the projection is made.

Its peculiar feature consists in the fact, that by it we are enabled to represent two-thirds of the surface of the globe in a strictly geometrical projection, much in the same manner that a hemisphere is represented in the stereographic projections; but as two-thirds of the surface of the globe includes the entire continents of Europe, Asia, Africa, and America, and indeed all the habitable regions of the globe, with the exception of part of Australia and some of the islands in the Pacific, this projection gives a more accurate representation of the relative position of every portion of the habitable globe (with the above exceptions) than any other, and as the circles of the parallels of latitude, down to the parallel of 47°, are complete, the circumpolar regions are very accurately represented. Availing himself of this latter advantage in his new projection, Colonel James is now having maps of the stars made on it, in which the circumpolar stars will appear in their true relative positions to each other and to the other stars, which will be included in the same map.

This projection of our Earth will be found of great use in many

scientific inquiries, and particularly when employed for geol
lectures, in which it is required to bring as large a portion a
sible of the land of the globe under the eye at once, and in
such distorted projections as those of Mercator or Babinet c
be satisfactorily used.

Metallic Boats.—Our associate Major Vincent Eyre having
gested the use of metallic boats for Arctic as well as other e
tions, our Vice-President Sir George Back has strongly recomm
the adoption of them for every purpose of inland navigatio
among ice. Their great superiority to boats of wood was,
minded us, clearly indicated when Lieutenant Lynch in 1848
down the river Jordan, running through thirty or forty des
looking rapids and cascades, and, though frequently striking a
sunken rocks, they received no injury beyond a few indenta
whilst a wooden boat of the expedition was broken up and los

Bells on the Goodwin Sands.—Mr. George Chowen has sugge
plan of attaching bells to the buoys placed over sand-ban
rocky reefs, so that in heavy mists and storms when the ma
cannot discern the buoy, he may be warned off by the ringing
bell, which will sound as long as the buoy is agitated by the w
Leaving this matter for the consideration of our nautical men
the suggestion seems to me to deserve serious consideration; s
that such bell-buoys might be advantageously used, not onl
sandy shoals like the Goodwin Sands, but might, if found to
well, be placed on lines at a certain distance from dangerous
headlands on which so many wrecks occur, such as the Dea
and the Land's End in Cornwall.

France.—Among the many proofs of the prevalence of the
feeling now happily subsisting between our nearest foreign n
bours and ourselves, the proceedings of the Geographical Soci
France offer striking examples. Thus we have seen the ac
plished geographer M. de la Roquette zealously devoting his
energies to the publication of a sketch of the life of Franklin,
then coming forward generously with a large subscription to a
the final search after the ships and crews of our illustrious co
man. Next we find the same liberal spirit evinced in the awa
their annual Gold Medal to our own Livingstone.

When we turn from the general efforts of the Geograp
Society of France to the works executed by the Imperial Go
ment, we recognize a steady progress in the surveying and map

of all tracts, coasts, and bays to which the influence of France extends.

Through the obliging communication of Rear-Admiral Mathieu, the Director of the Charts and Plans of the Imperial Navy, a catalogue has been transmitted to us of all the works of that nature which have been published, or are in the course of execution, during the years 1856-57. Referring you to this list which will be published in the Appendix to our Volume, I may now simply state, that it comprises four charts of the rivers Gironde, Loire, and Seine, in France; seven of the coasts of Italy, from Genoa to the Tiber; three of the Black Sea and environs, one of which is a detailed plan of the Bosphorus, in three sheets; and no less than fifteen charts and plans relating to various parts of the Mediterranean, both on the African and Spanish shores, even up to Ceuta, Algesiras, and the Straits of Gibraltar. In the sequel, and in speaking of the absence of good maps of Southern Italy, it will appear that in her occupation of the Papal States, France has effectually supplied that desideratum.

If we turn to the far west, we perceive that our active allies have been vigorously surveying the coasts of that central region of America which now justly occupies public attention, and that Haiti, Bahia, and New Grenada have also come in for their share of exploration; whilst of Newfoundland, not less than ten plans of bays, havens, and islands have been completed. From Iceland on the north to China and New Caledonia on the south-east, we have numerous examples of that zeal and precision of geographical survey which has characterized the French geographers from the days of d'Anville and Cassini.

To five new plans of the ports and bays of New Caledonia, a chart of the Archipelago of Pomatou, and six charts and plans of portions of the coast of China, are to be added numerous works included under the head of "Nautical Instructions," which are of great value to all seamen. In the present list we meet with Illustrations of the Sea of Azov, Nautical Description of the North Coast of Morocco, Instructions for entering the Port of Alexandria, Manual of the Navigation of La Plata, Description of Passages between Luçon and the Main Islands of Japan, together with General Considerations on the Pacific, &c.

Spain.—This ancient kingdom, so renowned in history, has hitherto remained without a Trigonometrical Survey, though its surface is, perhaps, more diversified and offers more attractions to the physical geographer than any area of similar extent in Europe. The Spanish Government is now, however, removing this opprobrium, through the agency of a commission composed of officers of the Engineers, Artillery, Staff, and Navy.

In 1854 the preparatory works were commenced for laying down the Trigonometrical Survey of Spain. The principal base line was measured on the plain near Madridejos, in the province of Toledo, and on the road to Andalusia, about 100 kilometres from Madrid. Its length is 14,480 metres. The first reconnaissances for several systems of triangles were made in the same year 1854, and in 1855 and 1856. One of these follows the direction of the meridian of Madrid, near which the primary base line is situated, and ends northwards in the neighbourhood of Motril, resting on the great mountain range the Sierra Nevada, and comprising in its network the towns of Ciudad-Real, Jaen, and Granada. Towards the north it is prolonged to Santander, including Segovia and Burgos. This chain is extended eastward, following the coast till it joins that of the triangles of the French Etat-Major on the Pyrenees, at the stations of Biarritz and Baigorry. This portion comprises the capitals of Bilboa and San Sebastian.

Another series is extended in the direction of the parallel of Madrid, and runs eastwards to the Mediterranean, resting on several points of the French triangulation made by Mechain and Delambre, and subsequently by Biot and Arago, for the prolongation of the meridian of Dunkirk, and taking in the chief towns of Teruel and Castellon de la Plana. Towards the west, this series passes by Avila, and for the most part following the direction of the Sierra de los Gredos, terminating in the interior of Portugal, on stations of the triangulation already made in that kingdom.

Another secondary series, leaving the last mentioned, has a northward course, terminating in the Cape Di Peñas, taking in Salamanca, Zamora, Leon, and Oviedo, all capitals of provinces. This chain is intersected perpendicularly by another which commences from that of the meridian of Madrid, to the south of Burgos, and runs westward, taking in Palencia, and following nearly the northern boundary of Portugal, until it reaches the sea near Vigo.

Another secondary chain of triangles has been similarly projected, which rests on that of the parallel of Madrid eastward, and stretches northward to Pampeluna, to connect itself with the French triangulation of the Pyrenees, passing by the Moncayo and between

Saragossa and Soria. This chain has a branch which runs westward between the towns of Soria and Logroño.

In the early part of this year (1857) the instruments arrived for the definitive measurement of the fundamental base line, which will probably be effected immediately. Of late years, the Corps of Engineers has continued the survey of the fortifications and their environs with great minuteness and precision, whilst the Etat-Major has executed military reconnaissances of the principal lines of communication and of the battle-fields of Spain. The works carried out by the engineers of "Ponts et Chaussées" and other persons concerned in projecting roads, and especially railroads, have produced some interesting geographical details, especially with reference to the inequalities of the surface.

The commission formed for making the geological map of the Province of Madrid has zealously continued its labours in it and in the surrounding districts. Some of its Members, moreover, have made some interesting reconnaissances and surveys in the mountains of the provinces of Palencia, Santander, and Leon, which will be continued throughout the length of that great mountain range.

In the course of 1856 our correspondent Colonel Coello published maps of Almeria, Orense, and Ponteviedra, and the supplements of Leon, Caçeres, and Badajoz. The engraving of the maps of other provinces, by the same accomplished geographer, is far advanced, and in 1857 the remaining reconnaissances may, it is hoped, be finished.

Some memoirs and articles bearing upon the geography of Spain have also been published, both in separate papers and in the scientific journals, the 'Revista Minera,' the 'Memorial de Ingenieros,' &c.

M. A. de Linera has completed a small work upon the Sierra Nevada. M. Rojas Clemente had, half a century ago, fixed the height of the peak of Mulahacen at 3555 metres, an altitude which has been adopted by the Bureau des Longitudes of Paris. From new measurements it appears that this peak is only 3399 metres high; and hence the peak of Nethou, in the mountains of Venasque, in the Pyrenees, and near the French frontier (3405 metres), would seem to be the highest point in Spain.

Between the Pyrenees and the Sierra Nevada there are three other very considerable mountain groups. 1st. The Sierra de los Gredos, the highest peak of which, or Plaza de Almanzor, reaches to 2630 metres, according to the trigonometrical measurements of M.

Subercase. 2nd. The Torre de Cerredo, one of the celel '*Picos de Europa*' between the Asturias and Leon. Accordi the observations of M. Casiano de Prado the mountain is metres high, and is composed of Carboniferous Limestone. La Sierra Sagra de Huescar, on the borders of Andalusia an kingdom of Murcia. According to the observations of M. Verneuil and Collomb,* this lofty mountain (2400 metres) is posed of Jurassic Limestone.

That indefatigable explorer and sound geologist, M. Casia Prado, aware that he could not adequately express those geol discoveries which he is continually making in his native la unprovided with good geographical data, has himself survey province of Palencia, of which, in the course of the year, a will be published exhibiting all the geological as well as g phical features of that interesting tract. M. Casiano is als tinuing his researches in a more southern region, and is pre a map of the province of Leon.

M. Vezean, a young student of Montpellier, has, it appears lished a geological map of the environs of Barcelona, the d which are spoken of favourably by M. de Verneuil, as having laid down on a local survey, which contains many correcti pre-existing maps.

I cannot conclude this notice of the progress of geography i Peninsula, without reminding you of the great value of the rese of my dear friend and old companion in Russia, Sweden Germany, M. Edouard de Verneuil, one of the most disting members of the French Institute.† During several conse years this eminent geologist and palæontologist has so lab entirely at his own cost and unaided by any government, th has not only thrown a new light upon the internal structu large regions of Spain, but has, by careful barometrical mea ments, determined the heights of many of the most lofty moun and of localities equally important to the geographer and nat as to the geologist, all of which were previously unknown.

Switzerland.—The very able notices on the progress of geography, which have been received by the Secretary fron distinguished correspondents Chaix and Ziegler, will be noticed in an early publication, and reviewed at the next Anniversary.

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* See Tableaux Orographiques par MM. de Verneuil, E. Collomb, et de L Bull. Soc. Geol. de France, 1854, and Comptes Rendus, tom. xl. 1855.

† The account of the progress of geography in Spain I owe to M. de Ve who obtained the details of the Government Surveys from Colonel Coello, maps, above alluded to, are to be added to the great statistical work of M. M

Italy.—The most important contributions to geography during the past year have been the continued publications of the great Government Surveys in Piedmont and Central Italy.* The Piedmontese survey, on a scale of $\frac{1}{50000}$, is nearly completed, and upwards of forty sheets have been already given to the public.

My predecessors in this Chair and myself have had occasion to allude to the Austrian Survey of Central Italy, perhaps the most important work of the kind connected with Italian topography. I am happy to announce that this great work is now completed—the last sheets embracing the mountainous region of the Marcii, Hernici, Volscii, and Sabines, on the Roman and Neapolitan frontier. The Carta Topografica dell' Italia Centrale, in fifty-two sheets, embraces the whole of the Tuscan and Roman States, on a scale of $\frac{1}{86400}$, and forms a suite to the elaborate surveys of the Lombardo-Venetian kingdom, and of the Duchies of Modena, Massa, Carrara, Parma, and Piacenza, published some years before by the same Government. A reduction of the Italia Centrale, in four sheets, is now in progress at Vienna.

Rome.—The wish so long felt by every antiquary, geographer, and geologist, to possess a good map of the environs of Rome, has been at length satisfied by the publication of the elaborate survey, undertaken by the officers attached to the French Army of Occupation, and of the last sheets of the Austrian map of Central Italy. The French map, in four large sheets, has just been completed, and is in every respect worthy of the Dépôt de la Guerre, from which it has been issued. The scale is the same as that of the great Trigonometrical Map of France, $\frac{1}{80000}$; it embraces all the Roman territory between the parallels of 41° 30′ and 42° 20′, and as far east as the meridian of 12° 55′ east of Greenwich, consequently the most interesting parts of Southern Etruria, of the Sabine territory, and of Latium, in the vicinity of the capital of the Roman world. The topographical details are beautifully laid down; those of the volcanic group of the Alban range are in this respect remarkable. Two advantages of the French Survey over the Austrian, consist in having the heights of the principal localities marked, and their ancient names annexed. The Roman Government is now preparing a map of the environs of Rome, nearly upon the same scale as the French S upon which will be laid down the principal estates of the landowners; and M. Rosa, a very laborious topographer, wh already surveyed in great detail many of the most inter districts around the Eternal City, has just completed a very tiful map of the Alban hills, on the eve of publication by the I Topographical Office (*La Direzzione del Censo*).

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* For these details respecting the geography of Italy, I am indebted to my gifted friend Mr. Pentland.

In the posthumous work of the late eminent Antiquary, Arc and Topographer, Commander Canina, are contained several and plans of considerable interest in a geographical point of amongst which the revised edition of his great map, in six s of the Campagna of Rome, of the Upper Valley of the Anio detailed plans of the most remarkable ancient towns and cl sites of the Alban Lakes, and the ancient ports of Centum Portus Trajani, Ostia, Antium, &c. &c. Connected with ou suits may be mentioned the detailed statistics of the Roman (*Statistica della Popolazione dello Stato Pontifico*), just published b Papal Government.

Naples.—I am not aware that any progress has been made b Government of this country in the great Survey of the king inaugurated by our late Associate, General Visconti.

The French Dépôt de la Marine, having obtained the cons the King of Naples to prolong its hydrographic survey of the Coasts of Italy, beyond the Neapolitan frontier, M. Darondea been able, during the past year, to complete it as far south including the Bay of Naples, the Ponza Islands, &c. This, the survey of the Roman Coast, is terminated, as my f Mr. Pentland tells me, and will form a worthy complement t great survey of the coasts of Italy, commenced in 1841, and w extends from the mouth of the Var to the Island of Capri. Darondeau is now engaged in rectifying the charts of the I Islands, in the position of some of which errors of importance recently been pointed out.

Island of Sardinia.—General A. della Marmora has complete labours on the Physical Geography and Geology of this intere island, by publishing the last volume of his great work, conta geology and descriptions of the fossils, by the eminent palæontolo Professor Meneghini, of Pisa. As General Alberto della Mar (brother of the Sardinian commander-in-chief in the Crimea) devoted the best years of his life to the accomplishment of th duous task, I have sincere pleasure in recording my hearty approval of a work, in which he has united the powers of a skilful physical geographer with those of an indefatigable geologist.

GERMANY.

The progress of geographical science is now so well promulgated through Germany by the 'Mittheilungen' of Dr. Petermann, that it is unnecessary I should do more than call attention to the value of this methodical and well-illustrated monthly Periodical. In it are to be found accounts not only of what is written or recorded in the Geographical Societies of Berlin, Vienna, and other cities, under the guidance of a Humboldt, a Ritter, and a Haidinger, but also reports of descriptions of newly-explored countries in various distant regions, accompanied by well-executed maps.

Aware that a certain amount of discontent has sometimes been expressed, at the appearance for the first time in this German work of the voyages and travels of individuals who have been, or are in the pay and service of Britain, I would beg my associates to consider, how natural is the feeling of any foreign traveller engaged in the British service, to wish to see the outline of his researches first made known in his native land, and how his countrymen on their part should feel a just pride whether in perusing or in publishing the writings sent home to them in their vernacular freshness from remote corners of the earth, with which they are necessarily less familiar than the people of a maritime country like our own.

Whilst then there have occurred examples of the publication of the outline of travels of English agents for the first time in German, which might have been previously noted in the Proceedings of our Society, as coming from the Secretaries of State who are our Associates, and who usually send to us their earliest communications respecting foreign travels, I would earnestly deprecate anything approaching to a feeling of uneasiness upon this subject.

Contented with the reflection, that knowledge cannot be too widely diffused, let us hope that our German friends, clearly recognizing and honouring the British channels through which their information is obtained, will always work harmoniously and in unison with us. Banishing therefore all jealousy, and admiring the perseverance and skill of such contemporaries, I am bound in fairness to say, that the 'Mittheilungen' is exercising a powerful and salutary influence on the progress of our science; and as the spirited proprietor of this Periodical, M. Justus Perthes of Gotha, has spared no expense in bringing out the work in an attractive form, so I rejoice to hear that its sale is becoming very large—upwards, as I am told, of 3000 copies being in monthly circulation.

The advancement of our science in Prussia has, I am sorry to say, received a serious check in the recent decease of Dr. Gumprecht, the Editor of the 'Monats-Berichte' of the Geographical Society of Berlin, who, after successfully prosecuting some branches of geology, had devoted himself with great energy to the extension of our acquaintance with the geography of Southern Africa. But what is most deeply to be regretted is, that he was suddenly carried off when engaged in a great and important work on the geography of Germany, a subject, on which I hope, through the assistance of my friend M. Ritter, to be better enabled to speak at our next Anniversary.

In this brief and very imperfect notice of the progress of geography in Northern and Central Germany, I have great pleasure in specially acknowledging the accession to our collection of many valuable maps published by the Bavarian Government, which have been communicated to us through His Excellency Baron de Cetto.

Of the distinguished travellers Schlagintweit it is my province to speak in a notice of Asiatic discoveries.

Austria.—Endowed with various noble establishments for the advancement of science, possessing many good geographers, and publishing most admirable maps of the different parts of her empire, Austria was without a Geographical Society until the 21st of September of last year. It was then that my valued friend William Haidinger, long known as an eminent mineralogist and geologist, and much esteemed by his contemporaries in every land as well as in his own, uniting with a few zealous friends, and obtaining the consent and protection of the Government, established the Imperial Geographical Society of Vienna. To a great extent this body, like that of St. Petersburg, is founded on the model of our own Society, though the regulations and interior management necessarily vary with the different form of the Government of the country.

In speaking of the Proceedings of this Society, I cannot avoid specially alluding to one point of the proceedings of our Austrian friends; namely, the recent departure of the Imperial frigate the Novara on a voyage of scientific exploration round the world. When this expedition was decided upon, and a number of able men were chosen, to form its scientific staff, the President of the Imperial Geographical Society having applied to me, and explained its object, I had real gratification in writing letters of introduction to all the authorities, with whom I was acquainted, at the places which this frigate might visit. Admirably organised, the expedition has enjoyed the great advantage of having had its officers furnished (as M. Haidinger informs me) with the minutest instructions of the venerable Humboldt, whether upon the magnetic equator, the magnetic curves in the different oceans, the lines of no deviation and equal intensity, or on cold and warm currents, particularly those along the Peruvian coast, and on the tropical East and West counter-currents. The great traveller has also enjoined the cutting of marks on the rocks, to register the actual mean level of the sea, the same practice which he had formerly recommended for adoption on the shores of the Caspian; and he has especially urged the collection of specimens from the active volcanos of South America, which he has enumerated *seriatim*, with a view to a correct classification of such igneous products, which he believes will be found to exhibit an arrangement in separate linear masses.

If I may judge of Dr. Scherzer and the other gentlemen who accompany him by the encouraging example of his associate Dr. Hochstetter, the geologist, who visited this country to obtain from General Sabine information and instruction in making magnetical observations, I can have no hesitation in saying that this first effort of Austria to circumnavigate the globe will produce a harvest worthy of that ancient empire, and will reflect the highest credit on the new-born Geographical Society of Vienna.

Russia.—With the return of peace, which has happily taken place since our last Anniversary, it is most gratifying to one who has been so long connected with the science of Russia as myself, and who has been so heartily welcomed in that Empire by all persons, from the Emperor to the peasant, to be enabled to recur to the geographical labours of those old allies of our country, to whom I am naturally much attached.

Whilst the late war impeded all scientific communication with the countries of the West, Russia was steadily advancing researches of the highest importance to physical geography in her distant and slightly known territories, and particularly on the north and east. The great expedition to the northern part of the Ural Mountains, under the conduct of Colonel Hoffmann, had indeed obtained, before the war, the active support of the Imperial Geographical Society, and of its President the Grand Duke Co tine.

The second volume of the work descriptive of this long and rious enterprise has recently been published; the first pa Krusenstern, having already been made known to geogra This second volume specially relates to the 'Pae-Khoo,' or Mountains, and has completely satisfied the expectation of n lists, physicists, and geologists. The historical and geologica tion by Hoffmann; the classification and description of the organic remains by Count A. von Keyserling, my distingu coadjutor in earlier days; and the descriptions of the mi by Gustaf Rose; of the animals by my colleague of the Im Academy, Brandt, and of the flora by Ruprecht, together meteorological, physical, and hypsometrical observations, a of a high order of merit. The exploring parties examined the cipal chain of the Ural, north of Petropaulovsk, from the sour the river Petchora up to the highest northern peak (68½° N. la 66¼° E. long.), which, hitherto nameless, had been termed by th pedition Konstantinov Kamen, in honour of their geographical dent, his Imperial Highness the Grand Duke Constantine. ward from this point runs another mountainous ridge, the Pae- continuing in a W.N.W. direction, and running parallel to the nor coast as far as Vaigats Strait. The highest point of it is the daia, and the geological structure proves that the Pae-Khoo is n hitherto supposed, a continuation of the Ural.

The average height of the northern Ural is about 3000 (th Poss and Sablja are above 5000) feet. Patches only of sno visible on some mountains, but no lasting covering of it is s 68° N. lat.; although, as Leopold von Buch remarks, snow is in Norway at 67°, and at a height of 3800 feet only. volumes in which these important explorations are describe characterized by a minuteness of detail, on all branches of s within the scope of the undertaking, which entitles the w rank as one of the most valuable scientific publications that I has ever produced. The accompanying map is of great practical geographers, and a marked addition to the pre-ex geography of Europe.

The efforts of the Imperial Geographical Society to diff adequate acquaintance with our science throughout the interi Russia have been most commendable. Thus, this body not publishes volumes and bulletins like our own, but also tran into Russian, useful standard works, including those of the celebrated Carl Ritter, and brings out catalogues of the geographical maps of Russia, as well as reviews of geographical, statistical, and ethnographical labours. Even the commerce of the interior comes within the scope of our vigilant rivals, whose Society was founded on the model of our own.

The most extensive scientific exploration which the Society has ever undertaken, is one which is still in progress, or that of Eastern Siberia. Its object is to examine and determine, by astronomical and trigonometrical observations, the geographical features of the vast region between the Lena and the Vitima, and also of the south-eastern tracts beyond the Lake Baikal. The chief astronomer, M. Schwartz, has under his direction MM. Oussoltzoff and Sminiaguine, and is accompanied by the artist and academician Meyer, and by M. Radde the naturalist.

The results of the first year's labours are given in the 'Compte Rendu' of 1855, edited by M. Lamansky, and there can be no doubt that geographers will soon possess not only a correct delineation of these remote regions, but also striking and characteristic sketches of the scenery of all the border frontier regions of Siberia —a map of the river Amur having been already published. Among the great feats of our contemporaries, I learn that MM. Semenoff and Wasiljin have made known the existence of an extinct volcano near Mergen, in Manchuria, which was in activity in the year 1721; and that the mountain of Demavend has been ascended by M. Khanikoff.

In writing to me of these explorations, and of a remarkable expedition to the Lake Issingul, my illustrious friend Humboldt thus expresses himself:—"On the northern side of the great volcanic chain of Thian-Chan, they have, it is true, discovered plutonic rocks only, such as granite and gneiss, and along the edges of the great bitter lake of Central Asia (Issingul) no trachytes (volcanic rocks) have been seen; but it must not be forgotten, that from the eastern shore of that lake to the Volcano Peschan (the most western of the volcanos of the Thian-Chan, or Celestial Mountains) the distance, in a straight line, is not less than 250 English miles."

In reference to Eastern Siberia and those vast tracts of Central Asia which lie between the defined boundaries of the Russian and Chinese Empires, let me say that the English public will soon have presented to them a work containing the most vivid and remarkable

pictorial representations from the pencil of their countryman
J. W. Atkinson.

Under the patronage of the Emperor Nicholas, Mr. Atk
devoted seven years of his life to the exploration and delineati
a region, of the greater part of which no European had hit
obtained the slightest knowledge. Let my associates inspec
large original water-colour landscapes by this artist, repr
ing the marvellously tinted and wild rocky countries of Mon
the great Steppes of the Khirgis and Chinese Tartary, incl
views of even the snowy Thian-Chan, of which reduced en
ings will soon be published, and they will readily admit, th
such sterile, igneous, rocky masses, should not afford gold or s
they can prove of little value to any civilized country.

Among the subjects treated by the Russian geographers d
the year 1856, the mere enumeration of the following works, v
constitute a very few only of the communications to the Im
Society, will show the importance of its labours :—The Geogr
of Vegetables, in four vols., by M. Béketoff; the Fauna of the M
of the river Amur,* by Schrenck; a new Ethnographical M
Europe, by Koeppen; the Geographical and Ethnographical
minology of Central Asia, by Stchoukine; Report of Lieut
Oussoltzoff of a Voyage to the Sources of the River Vitima; an
account of those Volcanos of Central Asia, by Semenoff and
iljin, to which allusion has just been made.

Asia Minor.—In February of this year, I had the pleasure of
municating to the Society a memoir, which I had received
General Jochmus, relative to a proposed communication in
Minor between the Lake of Sabanja, the River Sakaria, and the
of Nicomedia. The utility of this project had been fully recog
in ancient times, and the question has been several times agi
at widely different periods, up to the close of the last century.
distance from the River Sakaria to the Lake of Sabanja, bet
which there already exists a natural communication by the
river of Sari-deré, is not much more than three miles and a half;
from the Lake to the Gulf of Nicomedia it is scarcely nine
whilst no difficulty exists on the score of difference of level. T
can be no doubt that such a system of canals, of sufficient

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* *See* p. 406 *ante*, for a notice of the hydrography of the river.

and depth to admit of the passage of coasting-vessels and small steam-boats, would open up valuable internal communication for the ready supply to Constantinople of wood, charcoal, and the most necessary articles of daily consumption.

Persia.—During the present session, whilst our country has been temporarily engaged in hostilities with Persia, it has been our good fortune to have present amongst us our distinguished medallist Sir Henry Rawlinson, who has enlivened our meetings by his agreeable and instructive lessons on the geography of countries with which he has made himself so intimately acquainted. By his extensive personal knowledge of the East, united with those varied attainments in classical and Oriental literature, which have made his name distinguished throughout the world, Sir Henry has been enabled not only to communicate to us information of the most important nature with respect to the modern geography of Southern Persia, but also to illustrate that information from the rarer resources of his own especial studies in ancient history. With respect, moreover, to the recent movements of our army in Persia, the strategical knowledge of Sir Henry has added a peculiar interest to his observations on the country where they have taken place. I cannot refrain from congratulating you, at the same time, on having had the advantage of two such able and experienced commentators on these interesting and important subjects as General Monteith and Mr. Layard.

In summing up the results of the information we have thus gained, I will here confine my remarks to that which is essentially geographical. The most striking points to which our attention has been drawn, in this respect, are the changes produced in the channels of the rivers and on the coasts immediately proximate to their embouchures. These important facts are worthy of especial notice, both in a prospective and a retrospective sense, since they will materially modify our calculations in the more doubtful reading of early history, and our judgment as to calculations with respect to the future condition of these coasts. The agents of these changes are clearly intelligible. There are but two winds which prevail in the Persian Gulf—the north-west and the south-east, and, when the latter sets in, the whole force of the Sea is brought to bear directly against the current of the Euphrates, and hence an enormous deposit of the alluvium brought down by the stream is effected, thus barring up its mouth. This deposit, constantly on the increase, progresses, by Sir Henry's calculation, at the rate of a mile in the lapse of thirty-five to forty years. An example of the of this agency in by-gone times is adduced in the fact, that a city, of which the ruins are to be seen above Mohammerah, w island in the time of Sennacherib, named Billat, and can be s to have been still an island in the time of Alexander. At the p time it is sixty miles from the embouchure of the river, and a cession of cities can be traced upon the desiccated delta bel along the river, down to the sea.

A question of essential moment has also been explained by linson as to the frontier line between Turkey and Persia,—a upon which our maps have been greatly wanting in correc The real line of frontier—as determined by the Commissi Delimitation, appointed under the provisions of the Trea Erzerúm—comes down to Mohammerah, and then follow course of the Euphrates to the sea. It was agreed that the co watered by the Euphrates belonged to Turkey, and the co watered by the Karun to Persia; but the question was, wh Mohammerah was on the Euphrates or on the Karun. I decided that the place should be considered to belong to Persi as according to Sir Henry's belief it is situated on the phrates, this decision would seem to be contrary to geogra accuracy.

Thibet.—Early in this year some extracts were read to the S from the memoir of a journey across the Kuen-luen from La Khotan, communicated by Colonel Sykes from the brothers S intweit, already so well known to geographers and naturalis their labours on the physical geography and geology of the Al

These accomplished gentlemen, who travel by the desire o King of Prussia, and at the suggestion of Baron Humboldt, been employed, under the patronage of the East India Com in the physical survey of the distant trans-Himalayan re The extracts communicated to us, form a small portion only o information they have sent home, but from some brief allusio the groups of hot springs near the Kiouk-Kiul Lake and the V of the Nubra, we may feel assured that, when all their me are published, they will be found replete with curious observa on many subjects; and specially on those mineral springs to w Humboldt long ago invited attention, as proofs that the Kuen was of volcanic origin.

The brothers Schlagintweit have laid down the entire orog of Kemaun. M. Adolf Schlagintweit, after visiting the glaci

Pindari, was joined by his brother Robert; and they examined together the glacier of Milum, which surpasses in extent all those of Switzerland. It is from 8 to 10 miles in length, and 3000 feet broad. The mountains which surround this glacier consist of crystalline schist, covered by fossiliferous strata of the Silurian age. The two brothers have also measured the height of Nanda Devi, an insulated peak surrounded by deep precipices, at the foot of which is the glacier of Pachou.

But rather than attempt, on my own part, any sketch of what these distinguished German travellers have accomplished, I will here quote to you, from the pen of Humboldt himself,* a short summary, which he has sent me, of their remarkable explorations.

"Hermann and Robert Schlagintweit," says the Baron, "have had the proud satisfaction of passing in August, 1856, the chain of the Kuen-luen mountains, and of reaching Eltschi in the province of Khotan. As I am vain enough to believe that my map of Central Asia (the result of five months' labour, in bringing together the detailed accounts of the Buddhist priests Fahian and Stenan-thiang, with those of Marco Polo, Wood the explorer of the Pamir, Burnes, Vigne, together with the excellent sources of information supplied by Klaproth and Stanislas Julien) represents more faithfully the formation of the ground than the other maps in your possession, the range of which beyond the Himalaya is mythologically doubtful, I invite you to examine it before you read or rather try to decipher these lines. A botanist of the highest merit, Dr. Thomas Thomson, who, conjointly with my excellent friend Joseph Hooker, published in 1855 the 'Flora Indica,' says in the Introduction Statistique, p. 215, 'The chain of the Kuen-luen, where it forms the northern boundary of Western Thibet (where Dr. Thomson resided a considerable time), is as lofty as the Himalaya.' *Its axis has not been crossed by any European traveller*, but has been reached by Dr. Thomson, who visited the Kara-korum pass, elevated 18,300 feet. This testimony will show you the importance of the success of the brothers Schlagintweit. On the morning of the day, on which they crossed by the Kara-korum pass, they met a caravan coming from Yarkand, and near the salt lake of Kiook-Kiul they found the hot springs of Panamik and Tchanglung, with a Centigrade temperature of 74° 2′ and 78°, and on an immense plateau at altitudes of from

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* For the letters of the brothers Schlagintweit, communicated by Baron von Humboldt, see also the Berlin 'Zeitschrift der Allgemeiner Erdkunde' for 1856, pp. 532, 551.

16,800 to 18,000 feet, they had to endure a degree of cold at their nightly bivouac of 11° 4' Cent. below freezing point. Fahian, at the close of the 4th century, writing of Bushia south of Eltschi, the capital of the province of Khotan, praises its high cultivation; its elevation being not more than 9200 feet. 'We were at a day and a half's journey,' say the Schlagintweits, 'from the northern part of the high chain of Kuen-luen. After leaving Sumgal, we travelled for three days along the banks of the Karagash, which gave us an opportunity of inspecting the famous quarries of stone called Yaschem, which people come from a great distance to visit. Between Kara-korum and the Valley of the Nubra we measured several mountain peaks above 24,000 feet of absolute elevation. The dip of the magnetic needle between July and September is registered in figures.' The geological excursions of Adolf and Robert Schlagintweit in Eastern Thibet by Niti and Gertope, to the glacier of Ibi Gamin, have also been very important. The travellers reached it on the 19th of August, 1855, and trusting to the corresponding observations in Agra, fixed the height they attained on Ibi Gamin at 22,260 feet = 20,886 French feet. This is not only higher than I reached at Chimborazo (18,096 French feet) in 1802, and which Boussingault made (18,480 feet) in 1831, but it is also higher than the summit of Chimborazo itself, which I found by trigonometrical observation to be 20,100 French feet in height. As the Schlagintweits were the first who reached the top of Monte Rosa, they are accustomed to this kind of expedition. A portion of their magnetic observations of the Himalaya has been printed separately at Calcutta, and my respected friend General Sabine will doubtless give them due credit for their assiduity. They have also made some interesting and delicate observations on the influence of great heights on the variation of the magnetic needle. They will bring back to England some beautiful geological collections, perhaps even in the course of this autumn; for you are aware that by the munificence of the East India Company and the generous kindness of Colonel Sykes, who is a noble advocate of every thing which appertains to the sciences, the brothers Schlagintweit have received every encouragement."

When I reflect that these brothers have penetrated farther into Thibet and Tartary from the plains of India on the south, than any other European, that their physical, geological, and geographical observations are of the highest value, and that they have even made photographic sketches at heights of 20,000 feet above the sea, I cannot but rejoice, that these élèves of the great traveller of the age, should have performed journeys, which have elicited from that illustrious man, now in his eighty-seventh year, the expression which I have read to you, reminding us of the best days of the explorer of the Andes and Siberia.

Borneo, Burmah, and China.

Borneo.—Our Associate Mr. A. R. Wallace has supplied us with some important corrections of the north-west portion of the map of Borneo, derived from his observations in a journey up the Sadong River. From his account we gain valuable additions to our information respecting the physical geography of that vast island, together with some very interesting comparisons, bearing on the ethnological similarity between some tribes of the Dyaks and the Indigenes of the valley of the Amazon. Amid the uncertainty which hangs over the history of the migrations of various branches of the human family in remoter periods, these notices of distinct resemblance are of especial moment; and in the present instance the observations of Mr. Wallace are confirmatory of the views of Dr. Latham and others, who regard the Americans as Mongols who have emigrated direct from Eastern Asia.

A further exploration of this important island has been set on foot during the past year by Lieut. C. A. C. de Crespigny, R.N. Great importance must be attached to the investigation of the resources of this vast country, which is already known to be largely productive of some of the choicest desiderata for the advancement of civilisation. As a mineral country it is, according to Mr. John Crawfurd, perhaps the richest in the East. Gold, coal, antimony, iron, caoutchouc, and gutta-percha, have already been derived from it in abundance; and who shall say what further discoveries may lie open to the search of a skilful explorer? The geographical position of the island moreover, lying, as it does, in the direct route between China and Australia, presents an additional stimulus to the development of its unknown resources.

It is satisfactory to know that our Medallist, Rajah Brooke, has been anxiously occupied in developing various branches of industry within the range of his jurisdiction at Saráwak, among the most important of which must be classed the opening of coal-mines; and it is indeed a matter of sincere congratulation that he should recently have escaped from the imminent danger in which he was placed by the late insurrection of the Chinese settlers.

Burmah.—We are indebted to Captain Yule, of the Benga gineers, who had been sent by the Indian Government to Ar pura as secretary to Major Arthur Phayre, for a most valu communication on the geography of Burmah, with an illustrative of that country. Captain Yule has compared and brought tog with great ability the various valuable surveys of several c precursors in different parts of this extensive field of operations. principal materials were a Survey of the new British Provin Pegu, by Lieut. Williams of the Bengal Engineers, still in prog a New Survey of the Province of Martaban, by Mr. Hobda Survey of the Irawady to Ava, by Captain Rennie and Lieut. H cote of the Indian navy. Besides these data, Captain Yule tributes his own sketch of part of the Aracan Yoma range its passes, and a rearrangement of the Chinese frontier anc Laos States east of Burmah, as taken from the Route Surve Dr. Richardson and Captain McLeod. A considerable error i longitude of the Irawady at Prome, and the higher parts of stream, as assigned in previous maps, is pointed out. This e which, in 1853, Captain Yule had indicated as probable, Memoir on the Passes of the Yoma, has been confirmed by surveys since made. The geological portion of the work by Oldham, the Superintendent of the Geological Survey of I affords much important information respecting the structure of country, the rocks, and their relations; and renders the public additionally valuable by the observations it contains on the s ties of the productions of the country, including certain mineral stances described by that good geologist. This work, which printed for limited circulation at Calcutta, by order of the Gover General, is now in the course of publication by the East I Company, accompanied by a map, engraved by Mr. Arrowsmith; Mr. John Crawfurd, who, from his acquaintance with the Bur empire, is most competent to express an opinion, has spoken with marked approbation.

China.—Believing that our members would gladly receive formation relating to China from so competent an authority, I ind our distinguished member Sir John Davis to read at one of meetings a Paper of great value, and which many of you h with pleasure.* Certainly no living Englishman, and indee living European, was so competent to such a task. He is an the few of our countrymen who have acquired the difficult language of China, and he long filled the highest offices which an Englishman can discharge in relation to that singular country. The fruits of his literary labours have been several works, which have the rare merit of being at once popular and scientific. As one of the most important of these, his 'China and the Chinese,' is by far the best account of the empire in any language, I am glad to find that a third edition of it has just been published.

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* *See* Proceedings, No. IX.

AFRICA.

The additions to our acquaintance with the interior of Africa since the last anniversary, when my predecessor delivered the Patron's Gold Medal to Dr. Barth, have been considerable. That meritorious explorer of vast regions has since issued to the public three volumes, which, recording his earlier wanderings, are to be followed by two others, completing a work which will doubtless be considered the worthy termination of so many years of patient research under great privations. The maps which accompany the narrative have been executed by Mr. Petermann, from the careful itineraries of Barth, the astronomical determinations by Vogel of the positions of Murzuk, Kuka, and Zinder having formed the base. Dr. Overweg's determinations of latitude have been made use of as regards the route from Tripoli to Tintellust and the route to Musgu; and I learn from Dr. Barth that all these points will be discussed at the close of the work. I reserve, therefore, my full observations on the whole of the labours of the only British traveller who ever returned from Timbuctoo, until we have before us the concluding description of his arduous journeys. In the mean time, however, it may be truly said, that the volumes already published contain much valuable information, and show that Dr. Barth was so completely at home among the natives, with seven of whose languages he was familiar, and made such very diligent inquiries, that the information thus gathered, is far more ample and minute than that of his precursors; the itineraries, which have been compiled from hearsay evidence, being entitled to especial weight. It is particularly worthy of notice that the tracts which this traveller explored to the south of Lake Chad were found to be level, and abounding with lagoons, swamps, and long flooded tracts, analogous to those which Livingstone found to the south of the Equator, whilst the watershed between the affluents of Lake Chad and the river Benué, would seem to be little more marked, than that between the Zambesi and Lake Ngami of S. Africa. So much is this the case, that Barth suggests how boats may reach the lake in ascending from the sea.*

Independently of the impediments which the climate and its diseases offer to the research of Europeans, the other great obstacles presented to the enterprise of Barth and his companions have not, I apprehend, been sufficiently appreciated. All along the broad zone stretching across Central Africa, between 11° and 5° of N. lat., there prevails more or less a continuous and merciless warfare between the Mahomedans and the Pagans, which presents the most appalling checks to the traveller proceeding from the territory of any Mahomedan prince to whom he may be accredited. For whilst Livingstone has demonstrated the practicability of traversing vast tracts of Southern Africa, occupied by people speaking various dialects of the same language (none of them being Mahomedans), such facility of intercourse is forbidden through the region north of the equator. There, a solitary traveller, scantily supplied with means, has to cross this belt by proceeding through hostile tribes engaged in sanguinary warfare, and is at the mercy of every petty tribe and barbarous chief whose district he has to traverse.

Whilst in regard to Overweg, who, it appears, kept very few notes, we have to regret that nearly all the important information he had accumulated perished with him, I am bound to record that Dr. Barth deserves all praise for making and preserving detailed records, when struggling against depressing illnesses and great poverty.

From what we know of the efforts made by himself and his associate, it is, indeed, too manifest that the progress of discovery in Africa, south of Lake Chad, can be only very slow and gradual.

Such, then, are the difficulties from which Barth has escaped, and of which he is now rendering us a vivid and detailed account—such is the country in which Vogel and his faithful attendant, Corporal Maguire, were left. My predecessor has recorded in his last and only Address, what progress Vogel had made after leaving Barth in 1854. Foiled in his attempt to reach Adamawa, the route between Hamarrawa and Yolo being occupied by warlike bodies, Dr. Vogel had already determined by astronomical observations the real site of the important town of Yakoba, situated on a rocky plateau 2500 feet above the sea. Returning from Hamarrawa to Gombé, through mountains inhabited by Pagan tribes, he left Corporal Maguire there, and turned westward himself to determine the watershed between the so-called Yeou, the river which joins the lake Chad from the west, and the smaller and eastern branches of the Kwara or Niger. It was then that he discovered in a very hilly tract a northern or important branch of the Benué, named Gongola, and proceeded as far as Zuriga, the capital of Zeg-Zeg, the erroneous position of which in previous maps he corrected. Proceeding to Bebeji, the site of which he also fixed, he arrived at Kano, a place then afflicted by cholera, and, returning to Yakoba, again descended into the valley of the Benué at Zhibu of Dr. Baikie (Chunbum of Vogel). Visiting several places on the river, he observed a large cetaceous animal called Ayu, to which his attention had been directed by Barth, and since named by Professor Owen *Manatus Vogelii*. Having rejoined Maguire, who had suffered much in the mean time from sickness, they returned in December, 1854, to their head-quarters at Kuka. Procuring there fresh supplies he intended to proceed to the E. and S.E., and started for Waday on the 1st of January of last year, leaving Maguire in Kuka, since which time we have had no reliable tidings of his progress.

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* Vol. iii. pp. 202, 221.

Dr. Barth suspects, however, that he must have made some stay at Loga or Logone, visited by both Denham and Barth, and also at Bagirmi, where the latter traveller spent some months, as described in the third volume of his work.

Whether the order ever reached Vogel to direct his steps towards the Nile is unknown, but at all events it is certain that he was proceeding in that direction, when, as it is reported, he fell a sacrifice to the orders of the savage King of Waday, such being the news brought by the natives to Corporal Maguire,* and reported to the Foreign Office by Colonel Hermann, H. M.'s Consul at Tripoli. There is, indeed, too much reason to apprehend that this report may prove true, seeing that the King of Waday, a violent and revengeful man, may have taken the life of Vogel, because some of his sable majesty's property had unfortunately been seized and confiscated in the port of Bene-Ghazi to satisfy the claims of British merchants, and at the very time when an English agent was travelling in Waday.

On the other hand, knowing that both Dr. Barth himself and our other African Medallists, Galton and Livingstone, were reported to be dead, and are now happily among us, I still entertain some that the able and accomplished young Vogel may have escape rough treatment and detention only, and that he may return ceive the highest reward which this Society can offer for mining the true position of so many important sites of C Africa.

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* Corporal Maguire is coming home with the observations and instruments.

Renewed Expedition to the Niger.—From the explorations in C Africa, which have been progressing from the time of Mungo to the present day, let us now turn to the consideration of t pedition which has just been sent out to explore those parts of Africa, watered by the Niger or Kwara * and its tribu and which, recommended to the attention of H. M.'s Gover by the Royal Geographical Society and the British Associati the Advancement of Science, is commanded by our associat Baikie, who so successfully led the party on the former oc Our members will also be glad to hear that this officer is panied by the same intelligent surveyor, Mr. May, R.N., wh his companion during the previous voyage up the Chad Benué; by Lieut. Glover, R.N., well acquainted with sur and astronomical observation; by Assistant-Surgeon Davis and by collectors of natural history specimens; whilst it is ex that the well-known Church Missionary, the Rev. Samuel Cro may also join the expedition on the coast.

The vessel for ascending the rivers is the Day-Spring, a screw steamer of 170 tons burthen, prepared by Mr. Mac Laird, combining 30-horse power with less than 5 feet d of water, and arranged to carry three months' provisions and for 20 days. The main objects of the expedition as contempla the Earl of Clarendon, who has specially patronised and sanc it, and as organized by the Admiralty, are to explore the river and its tributaries, to ascertain the natural productions and bilities of the countries through which they flow, to ente friendly relations with the native chiefs, to facilitate the ret liberated Africans to their homes, and practically to sho advantages of legitimate trade over the debasing and demor traffic in slaves.

Ascending the Kwara to Rabbat, and leaving the steamer the party will, in the first instance, proceed by land to visit S where poor Clapperton died, and there present to the Mahomedan Sultan, to whom they are accredited, a firman from the Porte. After a short stay at Sakatu it is proposed that they should march westerly to Isai on the Kwara, a populous town visited by Barth in 1854, and thence descend the river by Busah in canoes and rejoin the vessel at Rabbat, a tract which may, I apprehend, prove rich in mineral contents. Now, whilst parts of this region have before been traversed by the travellers Park, Clapperton, Lander, and Barth, the first of whom was killed at Busah, the country is still much too imperfectly known to be accurately mapped, though, as we have just seen, Vogel has fixed the site of some adjacent places. Still less are we acquainted with its mineral constitution.

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* Spelt Kwara by Barth and by the Admiralty; Kwora by Baikie, and by old travellers.

As this expedition, well equipped and well found in provisions, medicines, and presents for the natives, will consist of 12 Europeans and 40 liberated black seamen, opportunities will be afforded of dividing the force and of exploring regions on either bank of the great river. Thus, the Government attaches great importance to the ascertainment of a safe route from Lagos and Abeokuta to Rabbat on the Niger, by which the liberated Africans can return to their homes, and extend their commercial habits to the places of their birth. During the period of the next year, when the river is low and the heat great, the party is to seek high and healthy ground near the confluence of the Benué or Chadda and the Kwara, where it is understood that Mr. Macgregor Laird will establish a commercial station.

When in the interior, however, the leader of the expedition is specially charged to impress upon the natives that the British Government is far from having any desire to establish colonies or settlements which might give umbrage and provoke quarrels, but is solely desirous of promoting such legitimate trade as, in enriching the natives and our own merchants, may effectually check the slave-trade.

A second rainy season will be devoted to the exploration and ascent of the Chadda or Benué, and, as the Day-Spring draws less water than the Pleiad did, it is hoped she may reach a higher point than was attained on the former occasion. It is possible that the fertile region of Adamawa, on the one hand, and Hamarrawa, on the other, may be explored, and even, if opportunity offers, that the higher part of the Old Calabar river in a more westerly meridian may be reached at some point above that to which Oldfield ascended in a steamer in 1836.

Heartily must this Society wish success to such a well-planned renewal of our intercourse with the more civilised and Mahomedan tracts of Central Africa, which, in addition to the acquirement of important geographical and natural history knowledge, has in view the object so dear to all philanthropists, of encouraging the natives to exchange their natural productions for the manufactures of Europe, and in abandoning their warlike predatory habits to take to the pursuits of agriculture and commerce.

Having taken a deep interest in that former expedition, which, under the command of the same meritorious officer, returned without the loss of a man, I have on this occasion prepared instructions for the geological examination of a region which I apprehend may be found to contain much mineral wealth.

In fact, if the survey be completed in the manner devised, the whole western side of Central Africa will have been so traversed, as to yield two important sections, which cannot fail to give us the knowledge we desire. The Niger, or Kwara, flows in a gorge across such thick ribs of rock as must surely enable the travellers to read off a clear lesson; whilst an excursion from the upper part of the Chadda to the sources of the Calabar on the one hand, and to the heights of Aed Hamarrawa on the other, will also afford an instructive parallel traverse of no less importance.

Rejoicing that Mr. May, the Master, of the Royal Navy, who laid down the soundings and defined the banks of the Chadda, should have returned from Canton, where he has been serving, during the capture of the forts under Admiral Sir Michael Seymour, to rejoin his old companion Dr. Baikie, and confident that they will both of them do all in their power to make geological observations, I must express my regret that there should not have been some one person in this expedition, whose special duty it was to ascertain the true condition of the substrata. For, inasmuch as one great feature of the enterprise is the discovery of sources for future trade, so surely must it be of paramount value to be made acquainted with sites of coal, iron, copper, lead, and gold.

Hoping, however, that the zeal and ability of the explorers may remedy the only deficiency which is observable in the project, I cannot terminate the subject without reminding you of our deep obligations to the Earl of Clarendon for his judicious and liberal support of an exploration which, carried out as it will be by the efficient orders of the Admiralty, must not only advance our favourite science, but will also, I trust, prove a blessing to the natives, and a boon to the commercial world.

The White Nile.—M. Ferdinand de Lesseps has collected, during a recent visit to Khartúm, some information on the present state of the several European settlements along the upper course of the White Nile.

It appears, from his account, that the missionary station of Don Ignacio Knoblecher has attained considerable importance. It is situated about lat. N. 4° 35′, and is above the highest point reached by M. d'Arnaud. A trading establishment has been formed by M. de Malzac among the Djours, at 300 miles west of the river, and between the 6th and 7th parallels of N. latitude, where he collects ivory, and sends it down to the Nile on men's shoulders, the country being too marshy to admit of the employment of beasts of burden.

It will be recollected that, in the Address of our late President, it was mentioned that, according to the opinion of M. Brun Rollet, so long a settler in these parts, the Misselad was entitled to be considered as the main branch of the Upper Nile; but M. de Malzac dissents from this opinion, and regards the Misselad as a tributary, and not as the main river. The question must, therefore, remain an open one, until we shall have received far more accurate hydrographical data about these regions, than we now possess.

Nile Expedition.—I have to notice with regret the failure of an expedition whose object was to explore the still mysterious sources of the White Nile. Organised with method, it was liberally paid for by the Viceroy of Egypt, and placed under the charge of the Count Escayrac de Lauture, a French geographer, previously known to us by his exploration of Soudan. But disunion and want of zeal among many members of his party becoming painfully apparent, that gentleman was unable to proceed beyond Cairo. In the mean time, however, the flotilla was ordered on in advance, and placed under the direction of our countryman Mr. Anthony Twyford, an able and adventurous young seaman, who, overcoming all obstacles, had the singular merit of carrying two steamers, upwards of 50 feet in length, and four sailing-boats, over the first, second, and third cataracts, to beyond Dongola! * Having laid in abundance of cordage at Alexandria, and commanding, through a firman of the Pasha, a vast number of the natives (at one time upwards of 3000 men), Mr. Twyford so skilfully applied his ropes to the projecting rocks, and so energetically urged on the men, that he reached Dongola in ten weeks from Cairo.

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* The flotilla was manned by sixty-six native soldiers and sailors, whilst Dr. Ponchet, a physician, and Mr. Clauge, a photographer, were of the party. The largest of the two steamers was left at Assouan.

When all the difficulties had been overcome, a messenger reached Mr. Twyford, and, to his great annoyance, ordered him to return, which he did, without loss.

Livingstone's * *Researches.*—Passing now to South Africa, let us see what immense strides have been made since our last Anniversary. Our late President, then speaking of the previous achievements of Livingstone, told us that the undaunted traveller was proceeding to the East to reach the Indian Ocean at Quilimane. But how apprehensive were we that, after all his marvellous escapes, this extraordinary man might still fall a victim to the climate in which so many of our countrymen had succumbed! Great, therefore, was the rejoicing, when those letters arrived † in which he narrated his passage from the interior low country, across the high grounds, and along the gorges of the Zambesi, and the great falls of that river, and announced his safe arrival at the Portuguese settlement of Tete!

Still greater was our joy when he landed on his native shore to receive that hearty welcome which was sure to attend a traveller who, having accomplished such feats, brought us back so much fresh knowledge respecting the interior and flanks of that part of the great continent of which we were previously ignorant.

The outline of the travels of Livingstone is now so generally known to the public, and has been so graphically presented by himself to various assemblies of his countrymen, that any rehearsal of it on my part is wholly uncalled for; the more so, as at the Special Meeting we held on the 15th of December last, in honour of his arrival, I offered those observations which were printed in your Proceedings. Whilst the public is anxiously looking forward to the publication of the details of these journeys, which I have reason to believe will take place in about three months, I will briefly advert to one or two leading features only of them.

The hypothesis I ventured to throw out in what I termed a "Comparative View of Africa in Primeval and Modern Times," when I presided over you in 1852,‡ that the central regions of

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* Since his return to England this traveller has changed the spelling of his name, adopting the form used by his father, and adding the *e* to Livingston.

† Addressed to myself.

‡ Journal Royal Geog. Soc., vol. xxii., Prel. Discourse, p. cxxi.

Africa would be found to be a comparatively low, watery expanse, the rivers issuing from which escaped to the east or to the west through gorges or rents in the subtending higher chains, was proved to demonstration by Livingstone, as respects that vast African river, the Zambesi.

The observations of this great traveller afford also the proof that several of the principal rivers of Africa south of the equator have their sources in comparatively level tracts of no great altitude. Just as the great rivers of Russia are separated at their sources by water-partings of such slight altitude, that Peter the Great connected these diverging streams by canals, so Dr. Livingstone has observed analogous phenomena in the heart of Africa. The African case is, indeed, still more remarkable. In this region Nature herself has made the connecting canal; for flat boats and canoes can pass northwards by the Dilolo river into the affluents of the Congo or Zaire on the west, and into the Zambesi on the east.

These humid regions, particularly towards the west side of the continent, are covered by lofty forest trees, abundance of ferns, mosses, and other plants requiring much moisture. Hence the explorations of Livingstone, opening out such new and unexpected data, induce me to put a question for solution by physical geographers. Why does it happen, that whilst moisture so prevails in lats. 10° to 15° south of the equator, the same districts equally distant from that line upon the north (as touched upon by Barth) should be arid and comparatively dry? After such positive data as those collected by Livingstone, we have indeed no longer occasion to stretch the imagination and suppose the existence of great snowy mountains from which the waters of the Nile take their rise; since we now see that the Zambesi and the Congo are supplied from marshes at lower levels than the chains through which those streams escape. The simple fact is, that in Central Africa there are two copious rainy seasons due to the periodical influence of the sun, the passage of which is accompanied by copious torrents. By the first of these rains the boggy lands become to a great degree saturated, but the water not overflowing, finds no exit in the absence of an adequate declivity. It is only when the whole spongeous mass becomes supersaturated by the second rains, that the waters rising to a great height, furnish the Zambesi with its annual flood.

In like manner the Nile may owe its annual flood to a similar cause—a point which can only be determined when our bold explorer, Captain Richard Burton, shall have informed us, whether the large Lake of Uniamesi be not the real feeder of the Nile, or if there really be lofty snow-covered mountains under the equator, as descried in the distance by our missionaries.

On this latter point I confess myself to have been to a great degree incredulous; whilst the last observations of Livingstone would lead me to suppose that the Nile, like the Zambesi, is fed from a great interior, boggy, and lacustrine region.

Again, in bringing home specimens of the white dolomitic rocks which constitute the eastern ridge, at a distance of 300 miles from the shore of Africa, and in expressing his opinion that such rocks range far to the N.N.E., or towards Kilimanjaro, the supposed sources of the Nile, Livingstone arrives at the suggestion, that the whiteness of those mountains near the equator, which the missionaries, who saw them at a distance, took for snow, may truly be nothing more than white quartz rocks and crystalline dolomitic limestones, which, glittering under a tropical sun, might well be mistaken.

Let us hope that the journeys now in progress by our clever and adventurous traveller, Captain Burton, from Mombas or Zanzibar, may settle this problem, and also determine the real nature and extent of the supposed great inland sea, on which our learned geographer Cooley has speculated, and of which the missionaries, Krapf, Rebmann, and Erhardt, have given us a rude sketch-map, compiled from hearsay testimony.

On this and many other collateral points it is not my intention to dilate; for he who would arrive at a sound conclusion must study the writings of Cooley and McQueen, and all the Portuguese authorities, and then collate them with the practical conclusions of Dr. Livingstone, who, having travelled over eleven thousand miles of African ground, and having wandered so long among the sources of the Congo and the Zambesi, is certainly the most valuable witness we can call, when such matters are under discussion.

Great as are the deserts of Dr. Livingstone as a discoverer of new lands, or as a missionary and philanthropist, his real title to the high estimation of the Geographical Society is, that by astronomical observations he has determined the longitude as well as latitude of so many sites, hitherto entirely unknown to us, and has constructed detailed maps of those regions. On this head indeed the language which Mr. Maclear, the astronomer at the Cape of Good Hope, has used is the most appropriate and truest eulogy which can be applied to our Medallist.*

Having observed in the character of my friend Dr. Livingstone a happy union of simplicity, patience, unruffled temper, and kindness, with the quickest perception, and the most undaunted resolution, I feel persuaded that, vast as have been his achievements, he is still destined to confer great advantages upon South Africa and his own country. His aim, when he returns to Quilimane and Tete, in the spring of 1858, or the first period of the healthy season, and after he has rejoined his old companions the Makololo, who are anxiously waiting for him, will be to endeavour to establish marts or stations beyond the Portuguese colony, to which the inhabitants of the interior may bring their goods for sale, and where they may interchange them for British produce. At these stations, which will be in those flanking, high grounds of the African continent that he has described as perfect sanatoria, he will endeavour to extend the growth of cotton, as well as to teach the natives how to till their lands, taking out with him for these intents cotton-seed, gins, ploughs, &c. He will further endeavour to bring to the English market a vegetable called Buàze, which possesses so tough and fibrous a tissue as to render it of great value even to the natives in their rude manufactures. Specimens of this plant, which grows in profusion on the north bank of the Zambesi, have been converted into a substance that has been pronounced by a leading manufacturer to be worth, when prepared, between fifty and sixty pounds per ton, and applicable to all purposes for which flax is employed. In this material, therefore, alone, to say nothing of indigo, cotton,† beeswax, ivory, and the ores of iron, with much good coal, we have sufficient indication that no time should be lost in establishing a regular intercourse with the natives of so prolific a region.

Thus, acting as the pioneer of civilisation, Dr. Livingstone will first engage the good will of the natives through their love of barter, and, having secured their confidence by honesty of purpose, he will the more readily be able to lead them to adopt the truths of that religion of which he is a minister, and of the value of which his whole life is a practical illustration.

Fortunate is it for our country that we have in the Earl of

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* *See* Proceedings, No. vii. p. 268.

† I learn with pleasure that great success has already attended the endeavours of the philanthropists who have introduced the culture of cotton near Abeokuta, in West Africa, and its preparation for export.

Clarendon a Minister of Foreign Affairs, who not less than the noble Premier has been the consistent and vigorous supporter of every measure tending to root out the trade in slaves; and impressed as our Government is with the desire to sow those seeds of civilisation among the natives, and probably realise the cheering prospect of a great production of the raw material necessary for our manufactures by the independent nations of Africa, let us hope that, whilst the Niger or Kwara Expedition under Baikie, to which I have adverted, is working towards that good end upon the West, the benevolent and enterprising Livingstone, already so dear to the natives, may be sent back to reside among his friends the Makololo, as the "Agent of the Queen of the people who love the Black Man."

AUSTRALIA.

Although there are grounds for believing that in the sixteenth century the Portuguese descried lands which, from their position in old MS. maps, must have been Australia, our own great navigator Cook was really the first to discover, examine, and describe large portions of the coast of this vast continent.*

Afterwards remaining for a long time among the "terræ reclusæ" of the world, this vast region, the interior of which proves to be a worthless desert,† now offers to the world the glorious spectacle of four great British colonies or separate governments on its eastern, western, and southern shores, whilst it pours forth on the old countries of Europe a shower of mineral wealth far exceeding in amount anything hitherto recorded in the history of mankind.

Thirteen years have elapsed since, as your President, I dwelt at some length upon an Australian topic, which seemed to me of paramount importance—the retention of Port Essington, and the establishment of other settlements in Northern Australia. Having lived to re-occupy this Chair, I will revert to the same theme; whilst I crave your indulgence if I previously engage your thoughts for a few moments on another Australian subject to which I have also given some attention—the gold produce of those countries.‡

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* An ingenious paper or two have been written to show that the discoveries of Cook may have been based upon a knowledge of those early documents, but in a forthcoming volume of the Hakluyt Society, our Associate, Mr. Major, will demonstrate that such suggestions are entirely fallacious.

† *See* Award of the Patron's Medal, p. 367.

‡ For the first printed documents relating to Australian gold, *see* the following Memoirs, viz.—Journal Royal Geographical Society, 1844, President's Address; Letter from myself to Sir C. Lemon, Transactions Roy. Geol. Soc. Cornwall, 1846; Letter to the Secretary for the Colonies, 1848; Report of the Nineteenth

If New South Wales has exhibited a diminished supply from most of those tracts which first gave forth their golden abundance, and has only recently been enriched by a small additional quantity derived from a part of Bathurst county, the great coast-chain, bending to the west, and passing from the high level of the Mount Kosciusko of Strzelecki to Victoria, has proved to be charged in certain spots with an amount of gold quite unheard of in any other part of the world.[*]

The extraordinary rise of the flourishing colony of Victoria is the necessary result of such a vast auriferous produce, and the simple fact, that upwards of 125 tons of gold were sent to Britain in the preceding year, exclusive of local use and exportation to other countries, is so astounding, that a few years ago the mind would have been incapable of measuring the effects which such an enormous addition to the symbol of material wealth might produce upon the destinies of the human race.

Without pretending to statistical acquirements, I formerly ventured to contend that, as the scarcity of the precious metals throughout vast portions of the civilized world had long been a growing evil, and that the hoarding of a substance so easily hidden as gold would continue, and even increase, in countries having unsettled governments, so it seemed to me[†] that, great as the supply might be, it would not be more than sufficient to meet the demand. The dry river-beds of the old world had, in fact, to be filled up with the golden stream; and experience has now shown us how long it has taken to fill them, and how inadequately they are yet supplied.

But then comes this question. If the present annual amount of supply from Victoria and California should continue, must not a great depreciation of the precious metal follow? Now the answer must be shaped in accordance with unquestionable geological and statistical evidence. Judging from experience, all gold-veins in the solid crust of the earth diminish and deteriorate downwards,

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Meeting Brit. Assoc. Adv. of Science, 1849, &c., Trans. of Sections, p. 60; Quarterly Review, vol. lxxxvii. (1850), p. 429.

[*] The total produce of New South Wales in 1856 was 138,823 ozs., whilst the returns from Melbourne for the same year give the enormous amount of 125 tons 6 cwt. 6 lbs., or a money value of upwards of 12 millions. My distinguished friend Sir Charles Nicholson, formerly Speaker of the House of Representatives at Sydney, informs me that there can be no doubt that gold is surreptitiously disposed of to a considerable extent (by the Chinese especially); so that the actual quantity of the precious metal produced is probably in great excess of that specified in the official tables.

[†] Quarterly Review, *supra*.

and can rarely be followed to any great depth except at a loss in working them. Again, as the richest portions of gold ore have been aggregated near the upper part of the original veinstones, so the heaps of gravel or detritus resulting either from former powerful abrasion or from the diurnal wear and tear of ages, and derived from the *surface* of such gold-bearing rocks, are, with rare exceptions, the only materials from which gold has been or can be extracted to *great* profit. These postulates, on which I have long insisted, in spite of the opposition of theorists and schemers, have every year received further confirmation, and seem, on the whole, to be so well sustained as matters of fact, that the real problem we have now to solve is, How much time will elapse before the gold of Australia is finally riddled out of these heaps or basins, or extracted from a few *superficial* veinstones?

It would indeed be presumptuous in any one who had not closely surveyed the rich auriferous tract of Victoria to pretend to answer this question; but I beg my associates to understand, that there is a wide distinction between the measurable capacity of the contents of these broken heaps, or rare thin veinstones *in situ*, and those imaginary mountains with bowels of gold of the theorist, the very thought of which has shaken the nerves of so many fundholders. For, it must be remembered, that all the accumulations of broken golden materials, or the great sources of supply, have well-defined bottoms. They are, in fact, troughs filled in with gravel or shingle, the cubical contents of which, when the country has been thoroughly surveyed, can be computed; and though it may never be possible to predicate the amount of ore contained in all parts of such slopes or hollows, yet, judging from the rate of excavation now going on, a good geologist like Mr. Selwyn, who is conducting the survey in Victoria, may well be able to give us approximate data as to the probable number of years required to empty out the metalliferous fragments from all those troughs or basins in which they have been detected.*

The other sources to which I have alluded, I learn from Mr. Westgarth, an intelligent resident of the colony, have however of late been worked to some profit. These are the narrow veinstones of quartz rock, two or three feet thick, which at the surface are rich in gold, and which have also been partially worked in California; and so long as the miner is near the surface, these veinstones will unquestionably well repay the cost of working them. When, however, they are followed downwards into the body of the rock, they have usually been found impoverished, either thinning out into slender filaments, or graduating into silver or other ores; so that these insulated thin courses of auriferous quartz—mere threads in the mountain masses—will soon be exhausted for all profitable purposes, when the upper portions shall have been quarried out.

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* A certain amount of the gold of Melbourne, whether occurring in drift or finely levigated clay, is reached by sinking shafts through basaltic coulées, which have evidently flowed in recent times, since they cover woody substances, including cones which, though in a charred or brown-coal condition, have been recognized by Mr. Robert Brown, as belonging to the remarkable Australian living genus, the Banksia, which that great botanist was the first to find and describe.

But whatever may be the duration of the gold produce, Victoria has already become a wealthy colony, whose agriculture and commerce have risen to a pitch which will ensure her future greatness, even should the period arrive when her rich golden harvests are no longer to be gathered.

Nowhere in the annals of mankind has there been known so wonderfully rapid a rise, as that which has taken place in and around a spot which, surveyed only a few years ago, was first formed into a separate colony in 1837. In each file of the well-written periodicals of Melbourne, we see pregnant proofs that this spot is already one of the great centres of the world's commerce, and is inhabited by an intelligent and advancing people, well worthy of the parent stock.

The latest accounts from Western Australia, given in the detailed explorations of it, as published in our Proceedings, afford little hope that our colonists are there to be enriched by mineral wealth; the great saline desert which Sturt tracked from south to north, and Eyre travelled upon coast-wise on the south-west, having been met with at several points by Gregory and Austin. Again, rich as is South Australia in her Burra-Burra copper-mines, no material quantity of gold has yet been detected in that colony, notwithstanding some vigorous searches, among which those of Mr. Herschel Babbage have recently been brought to your notice.

Turning, then, from that knot of elevations which, forming the background of Victoria, are so prolific in gold, and exploring that long Eastern Cordillera which leads from New South Wales to the Gulf of Carpentaria, though we may meet at intervals with an auriferous patch or two to entice the explorer northwards, the real incitement to new settlers is found in the rich soil and the good herbage they fall in with, as they extend civilization northwards. Thus, from the clear and accurate survey of the vast Peel River settlements by that sound mining geologist, M. Odernheimer, we now know that no valuable amount of gold is to be found there, either in the loose débris or in the solid rocks. Independently, however, of gold, the northern progress of civilization, as far as skill and energy can aid it, will assuredly be secured upon a solid basis by the present enlightened Governor-General Sir W. Denison.

The exploration of that eastern Cordillera, so long ago undertaken by our enterprising associate Count Strzelecki, to which I specially directed your attention in 1844, and which has since been carried further out by Leichhardt, Kennedy, and Mitchell, has recently had its northern and north-western offsets brought more definitely into notice by Gregory and his associates.* The advanced guard of the colonists has now even crept on so far beyond Moreton Bay, as to be already within about 560 miles of the head of the Gulf of Carpentaria; and judging from the fertile nature of most of the unoccupied lands, the period is doubtless not very distant when our countrymen will reach that great haven, which, penetrating for 500 miles into the continent, will surely, in future ages, be crowded with ships carrying on a great commercial intercourse between Australia and the Eastern Archipelago, Hindostan, and China.

Looking to that future, and even to our present interests, it was a subject of regret to many of us, that it should have been thought expedient to discontinue the occupation of Port Essington, and to abandon all intention of holding any other station along the northern coast of this vast continent. Unable now to enter upon a consideration of what bay of the eastern side of the Gulf of Carpentaria may be selected as an "entrepôt," I have little doubt that the time will soon come, when all minor difficulties will disappear before the energy of British colonists, in their endeavours to connect their Australian possessions with the rich marts of the Eastern hemisphere.

In treating this subject there is, however, another point which seems to me of such incalculable national importance, that I must beg your permission to say a few words upon it. If the idea of forming settlements through convict labour is to be discarded as respects the Gulf of Carpentaria, because the free population of New South Wales is advancing towards that great haven, then let us turn to that noble bay upon the north coast, of which Cambridge Gulf forms the western side, and whose eastern side receives the waters of the Victoria River. First explored by Philip King in

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* Award of the Gold Medals, *ante*. No auriferous tract appears to have been discovered by Mr. Gregory's party.

1819,* and by Wickham and Stokes in 1839, the basin of the Victoria was recently the scene of the encampment of Gregory, whence he extended his researches southwards to the saline desert, and eastwards to the Gulf of Carpentaria. The real opinion of such an experienced colonist and geographer (whose merits have been already dwelt upon in conferring upon him our Founder's Gold Medal) is of infinitely greater value than those speculations which would describe the whole of that region, on account of its latitude, as unfit for the settlement of the Anglo-Saxon race! The plain answer to this view is, that on the banks of the navigable river Victoria, the party of Wickham and Stokes were perfectly healthy in 1839; and that recently our countrymen were stationed there for nine months without the loss of a man. Our medallist Mr. Gregory, after a residence of many years in Western Australia, has thus written to his friend, the former Governor of that province:† "This portion of Australia far surpasses the western coast both in its fertility and extent, and its capabilities for settlement. Good harbours are numerous along the coast, and there is abundance of fine country for stock and cultivation." Again, he says: "The valley of the Victoria far exceeds the best parts of Western Australia both in fertility and extent."

Let us also hear what Dr. Ferdinand Mueller, the botanist of the last expedition, says. This gentleman, who, by his Australian researches, has, according to Sir W. Hooker, placed himself in the front rank of botanists, having collected in tropical Australia about 1500 species of plants, of which 500 are new, thus writes to his friend Mr. C. Latrobe, the former Lieut.-Governor of Victoria:—"North Australia, with the exception of the east coast, possesses essentially a *dry Australian*, and not a *moist Indian climate*. *Fevers do not therefore exist*, and we escaped such jungles and swamps as those in which Kennedy's party exhausted their strength. There is abundance of good country in North Australia, and, with access for vessels to the lower part of the Victoria, full scope for the formation of a new colony. But as a new settlement can scarcely be formed in such a remote and certainly hot part of the globe without prison labour, against which the public mind is turned with such decision, and as, without great inducements, the squatters will find it for a long time unprofitable to migrate in this direction, I fear that the pastures of North Australia will yet be left flockless for a long time." *

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* As these pages are passing through the press, my valued friend Dr. Fitton called my attention to his Appendix to the Voyages of that admirable surveyor the élève of Flinders, Capt. Philip P. King, along "Intertropical and Western Australia" (1826). I have communicated the letter of this eminent geologist to the Society, and the readers of our Journal will see in it an able effort to derive generalizations from the examination of specimens collected by King and the trend of the rock masses.

These descriptions of King and Fitton should be compared with those of Grey and Lushington, who in 1837 examined that portion of the north coast between Prince Regent River and the Glenelg, and also with the more recent observations of Mr. J. Beete Jukes, as given in his work entitled 'Sketch of the Physical Structure of Australia' (1847).

† Captain Fitz Gerald, R.N.

With such facts before them, it is possible that our Government may see that this prolific and healthy region, *so remote and so entirely cut off by the great interior saline desert from all our established colonies, that no intercommunication can possibly take place*, † is, notwithstanding its summer heats, a perfectly fit and proper receptacle for our convicts, whose labour there would completely repay their cost of maintenance. When our prisons are crowded, and crime is rapidly augmenting with our increasing population, it does indeed seem desirable to seize upon such a zone of exile as is here offered, and, by removing worthless characters from our land, render them really useful in occupying the only coast of that continent on which the British flag does not now fly, though it has been there twice unfurled. But I forbear to press this feature of a topic which can be better handled by politicians; and all I venture to urge is, that, whether by forced ‡ or free labour, North Australia should be colonised.

When presiding over you in 1844, and in then expressing an opinion from the best authority § that, if our Government would render Port Essington a permanent and independent colony, rich mercantile houses would at once set up establishments there, and freight large vessels to trade with the Eastern Archipelago and China, I wrote in the full conviction that, even if that particular station should be abandoned because it was exposed to tornados, other sites could be selected in a region, which so many experienced naval officers and other authorities have eulogised as offering capacious harbours and a climate not unsuited to Europeans—lands in which the pastures are magnificent, whilst the sea swarms with the finest fishes.

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* Mr. Elsey, the surgeon of the expedition, who has reached London whilst this Address is passing through the press, completely confirms this view of the productiveness and healthiness of the region.

† *See* Grounds of the Award of the Patron's Gold Medal to Mr. Gregory, and a description of these tracts.

‡ It has indeed been stated, that the inhabitants of the free colonies of Australia protest against any further transportation to that continent. Now, a resident of Victoria in S. Australia might with as much consistency declare, that there should be no penal settlement in any part of the world, as that the *Victoria of North Australia* should not be so first settled through convict labour; for the great interior saline desert more completely separates the northern from the southern region of Australia than any sea. That desert is utterly impassable by human efforts, and any convict who should escape from Victoria River or Cambridge Gulf would have to find his way by upwards of 4000 miles of sea voyage before he could reach Melbourne! It is indeed extraordinary that in the debates upon this subject, no allusion has been yet made to Cambridge Gulf and the rich basin of the Victoria river. *See* Debates H. of Commons, May 15, 1857, when Mr. Baxter quoted the Melbourne Correspondent of 'The Times.'

§ Journal Roy. Geogr. Soc., vol. xiv., President's Address, p. xcvii.

In the face, then, of these evidences, is the state of indifference of our country to North Australia to continue? Is Britain not to commence the formation of a settlement, whether by penal servitude or free labour, in the fertile basin of the northern Victoria or elsewhere, and thus secure future entrepôts for her commerce? What better guarantees can be had that success would follow, than the fact, that in the worst and most exposed part of this region (Port Essington) a British garrison was in a healthy state for several years, and that in its more southern portion the explorers in two expeditions have equally preserved good health?

Lastly, looking to the future destinies of our country, is it to be forgotten, that France has recently taken possession, not only of that New Caledonia which our own Cook discovered and named, but also of the Isle of Pines, where our colonists from Sydney carried on a trade in sandal-wood, and has thus acquired a "point d'appui" on the eastern flank of our largest Australian colony?

Or, ought we to close our eyes to the vast importance not only of securing good harbours of refuge in Northern Australia, but also of there establishing naval stations, which would prove invaluable for steam navigation, and where, in the event of war, our fleets may rendezvous, and thence move directly upon the flank of any enemy, who might be operating against our Eastern trade and possessions?

In short, it is scarcely possible to point to any region of the globe where British occupation is so imperatively called for, whether as a precaution, or with a view to future commercial interests. Expressing, then, an earnest hope that a settlement may be soon established on the banks of the Victoria, and in the adjacent Cambridge Gulf, and believing that great national advantages must follow, let us trust that, if such a consummation be attained, the proposers of it may not be forgotten, and that it will be remembered that the last

North Australian expedition, now happily completed under the direction of Her Majesty's Government, was a child of the Royal Geographical Society.

NORTH AMERICA.

British Possessions.—The gradual advance of civilized man towards the remoter regions of North-western America, has long drawn the attention of geographers to those extensive tracts, still distant from the settled country, which afford an almost undisturbed asylum to the aboriginal population of the continent. It would scarcely be credited, that within the limits of British America, a region including at least 112,000 square miles, extending from the head waters of the Assiniboine River to the foot of the Rocky Mountains, and from the northern branch of the Saskatchewan to the 49th parallel of latitude, our boundary with the United States, has remained almost completely unexplored.

The comparative scarcity of fur-bearing animals in this portion of the territory of the Hudson Bay Company, the warlike character of the Indians, and other causes, have alike contributed to prolong our ignorance of lands which may, at no distant time, become the home of thousands of our countrymen.

Mr. Palliser, a traveller, who had already spent a considerable time in the neighbouring districts of the Upper Missouri, and whose adventures as a sportsman form the subject of a popular work, conceived the project of employing two years in the exploration of the tract to which I have referred, along with the adjoining portion of the Rocky Mountains.

Mr. Palliser's original intention was, as I have understood, to undertake this journey at his own expense and with no other companions than those whom he might engage as voyageurs and hunters to join him in traversing the Indian territory. Having, however, addressed himself to our Secretary, his proposal was at once brought before the notice of the Council, by the direction of which it was referred to our Expedition Committee and fully discussed. In consequence of this a letter was directed by myself on the 6th of January to the Right Hon. Henry Labouchere, the Secretary of the Colonies, in which the Council strongly advocated the exploration of that portion of British North America between the parallels of 49° and 53° N. latitude and 100° to 115° W. longitude. The chief objects of the exploration were then stated to be—

1st. To survey the water-parting between the basins of the

Missouri and Saskatchewan; also the course of the south branch of the Saskatchewan and its tributaries.

2nd. To explore the Rocky Mountains, for the purpose of ascertaining the most southerly pass across to the Pacific, *within the British territory.*

3rd. To report on the natural features and general capabilities of the country, and to construct a map of the routes.

Mr. Palliser's experience, his success in conciliating the good will and respect of the Indians, and his anxiety to make his journey conducive to the increase of scientific knowledge, pointed him out as well fitted to be the leader; but it was evident that without the aid of fellow travellers trained to accurate research and accustomed to the use of scientific instruments, no very accurate results could be expected from the expedition.

After considerable discussion, the Lords of the Treasury consented, on the recommendation of the Secretary for the Colonies, to submit to Parliament a vote of 5000*l*. for this purpose, on the understanding that all the collections and results of the expedition should be placed at the disposal of Government.

Three scientific gentlemen have been since appointed to the expedition—Lieutenant Blakiston, of the Royal Artillery, on the recommendation of the President of the Royal Society, to conduct the astronomical and physical observations; Mr. Bourgeau, an experienced and successful botanical collector, selected by Sir William Hooker, the Director of the Royal Garden at Kew; and Dr. Hector, a medical gentleman recommended by myself on the score of his geological and zoological acquirements, as well as for his general fitness to contribute to the objects of the expedition.* Mr. Palliser is, moreover, himself conversant with the use of the instruments which have been supplied by Government, and has the advantage of an experienced assistant as his Secretary; so that the important object of determining the geographical position of the points visited by the expedition has been amply secured.

The instructions given to Mr. Palliser by H.M. Secretary of State direct, that the journals of the expedition, together with the records of the observations, shall be made out in duplicate, and that one copy shall be transmitted to England, from time to time, as opportunities may occur. An assurance was also given that the journal of the expedition shall be regularly communicated to this Society, according as it shall be received at the Colonial Office.

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* General Sabine has instructed Lieutenant Blakiston in making magnetical observations, a Committee of the Royal Society furnished the necessary instructions in physical science, and the geological suggestions were supplied by myself.—R. I. M.

The departure of the expedition was somewhat delayed by the severe illness of Mr. Palliser, but he sailed with his companions on the 9th of May, and information has been received of their arrival at New York in good health and with their instruments in working order.

During the present season it is intended that they should proceed from Fort William on Lake Superior to Lake Winnipeg and Fort Garry, examining *en route* some portion of the watershed between Lake Superior and Rainy Lake. From Fort Garry the expedition will proceed westward to the head waters of the Assiniboine River, and will explore some portion of the country between the southern branch of the Saskatchewan and the boundary of the United States, turning to the northward to winter at Carlton House Fort.

The summer of 1858 is to be employed in traversing the country of the Blackfeet and Blood Indians, between the two branches of the Saskatchewan, tracing the southern branch to the foot of the Rocky Mountains, and in endeavouring to settle the disputed question as to the existence of a practicable pass in the chain, between the Kootaine Pass south of the 49th parallel, and the Pass between Mount Brown and Mount Hooker, more frequently used by the servants of the Hudson Bay Company.

Apart from the public interest which belongs to the exploration of a large and important portion of British territory, it is impossible not to anticipate valuable additions to natural science from the united labours of the members of this expedition, and to feel proportional satisfaction, that Government should have seen the propriety of complying with our recommendation by fitting it out in an efficient manner.

Let me add, that the establishment of a direct line of intercourse between our Canadian possessions and Vancouver Island, which being 250 miles in length, contains good ports and valuable coal-seams, is not the least important of the national interests connected with this survey.

United States.—The omission at our last anniversary of the progress made in the Coast Surveys of the United States, was owing to the circumstance that the Reports of it had not been received. Since that date, however, the Society has received from Professor A. D. Bache, the Superintendent of the Coast Survey, the Report for 1854 of the progress of the department under his very able guidance. This great work has been so often mentioned with praise in former Addresses from this chair, that it is unnecessary for me to do more than direct the attention of all geographers to the continued activity and effective practical efforts of Professor Bache and his assistants.

The report on the United States Coast Survey for 1855, has, I regret to say, not yet been received. I hope, however, at our next Anniversary, to be enabled to do full justice to the advances in this department, and the other branches of geographical science which are in progress in the United States.

The eighth volume of the excellent 'Contributions to Knowledge' published by the Smithsonian Society has been received, and comprises most valuable papers by Mr. S. F. Haven, Professor Olmstead, Major Alvord, Dr. Jones, and Mr. Torce, to which I beg particularly to refer.

The American Geographical and Statistical Society—established at New York in 1854, under the presidency of the celebrated historian Bancroft—has now become a numerous and important body. I refer with gratification to one of the pamphlets which this Society has recently published, entitled 'A Report on Recent Discoveries in Sub-Oceanic Geography.' Referring to the data gathered by our Associate, Lieutenant Maury, in the Hydrographical Department at Washington, this Report as put forth by Mr. W. H. C. Waddell, U.S.N., points to the observations of Commander Rodgers, on the temperature and specific gravity of the waters of the Arctic Ocean at various depths; showing that near the surface the water is warm and light, at mid-depths cold, and at the bottom warm and heavy. This discovery, it is inferred, furnishes the only link that seems to have been wanting to complete by facts, the theory of open water in a really polar sea, as originally suggested by General Sabine, and as since supported by De Haven, Kane, and other Arctic voyagers.

Then, again, the deep-sea soundings of Lieutenant Brookes demonstrate that the most profound repose prevails at vast depths, the bottom being found to be of a down-like softness, and composed in most parts of the skeletons and casts of microscopic shells and infusoria.*

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* The details of the zoological results afforded by these operations between America and England, as conducted by Lieutenant Berryman, are reserved for future publication.

These observations, so important to the physical geographer, mariner, and naturalist, when combined with the experiments of Professor Morse, led the way to the formation of a company to construct that wonderful telegraphic cable of which I have elsewhere spoken, whilst the wind and current charts as registered in the United States have enabled speculators to select the best line for paying out the electric cord, which, scarcely thicker than a finger, is to connect the New World with the Old.

I must further refer you to the Report of the American Geographical Society for most curious information, as derived from the microscopic examination by Professor Bailey of West Point, of certain unabraded particles brought up from vast depths, which being ashes of volcanic origin, afford fine scope for the speculations of the geographer and geologist respecting the currents by which such materials may have been carried to their present tranquil abode.

One of the most striking works which the American Government has published in the last year is Commodore Perry's 'Narrative of the Voyage of the Squadron under his orders to China and Japan.' This work is replete with valuable geographical and ethnographical notices of the tracts visited, and is illustrated by many explanatory maps and lithographs. It was transmitted to us by that eminent scholar of the United States my friend Mr. Edward Everett, so justly valued by every man of science and letters in our country.

The question of the priority of discovery of the Bonin Islands, so amicably discussed between Commodore Perry and my predecessors the Earl of Ellesmere and Admiral Beechey, has, I trust, at length been settled by the memoir on those islands published in the last volume of our Transactions.

Geographical progress in the United States has been farther marked by the production of two maps of North America by the distinguished geologist Professor Henry Rogers, as brought out by Mr. Keith Johnston, of Edinburgh. One of these is purely a geographical map, on which the strait boundary lines of the different States, as marked by strong colours, necessarily interfere with the natural features of the country. The other, on the contrary, being a geological map, is a representation of ancient nature, in which the author's peculiar talents shine forth; and the masses of land, independent of the shackles which the interests of man have imposed upon them, stand out in all their simplicity.

Our library has also been enriched since the last Meeting with a work by Captain Randolph B. Marcy, of the U.S. 5th infantry, on his exploration of the Red River of Louisiana, in which he was assisted by Captain George B. McClellan, of the U.S. Engineers. The book is accompanied by reports on the natural history of the territories visited by the expedition, and also by two valuable maps of the country between the frontiers of Arkansas and New Mexico, and of the tract embraced within the basin of the Upper Red River.

Mr. J. G. Kohl, the industrious labourer in the field of statistical research, whose works on Russia and other countries have obtained for him due consideration, has now entered upon the illustration of the geography of America, and, as a prelude to labours which he hopes will be found useful, has just published a little treatise under the title of a 'Descriptive Catalogue of those Maps, Charts, and Surveys relating to America, which are mentioned in Hakluyt's Great Work.'

Though the last session of Congress was the short one, or from December to March only, the subject of geography was not neglected. Adequate grants of money were made for the publication of the surveys of the Expedition to the North Pacific Ocean and Behring Strait, and for finishing the publication of the Charts made by the late Expedition for the Exploration and Survey of the River la Plata and tributaries, as well as for an Exploration of the Paraná and the tributaries of the Paraguay River.

I am also informed that towards the verification of the Survey of the Atrato and Truando Rivers in New Granada, as proposed by Mr. Kelley (see last Anniversary Address, p. ccxxii), for the purpose of making a ship canal between the Atlantic and Pacific Oceans, Congress has liberally granted 25,000 dollars. It has also, I am happy to say, been intimated, that the Governments of Great Britain and France are not unwilling to assist in this very important preliminary Survey.

Central America.

The communication by canal between the Pacific and Atlantic, to which my predecessor called attention, has a much better chance of being investigated, now that all the states of Europe are at peace, and that the most friendly relations possible exist between the Governments of the United States and Britain.

The Proceedings record how favourably the project of Mr. Kelley of New York was entertained by this Society, and show how deep an interest we take in realizing the early anticipations and wishes of the illustrious Humboldt. I can only say that no exertion on my part as the President of this Society shall be wanting, to support any proposal which may be made to bring about such a simultaneous and conjoint Geographical Survey made by the Governments of Britain, France, and the United States, as shall definitively settle the points at issue, and demonstrate whether or not it be practicable to execute a great inter-oceanic canal.

SOUTH AMERICA.

New Granada.—Captain Battersby, who has been lately travelling in New Granada, strongly advocates the superior commercial advantages of the River Atrato over the Magdalena as a channel of communication, not only with the people on the upper waters of that stream, but with those of the extensive districts bordering the Cuenca, and of the cities of Antioquia and of Cartajo, the population of which alone he estimates at 30,000; expressing his belief that ere long the traffic on the Atrato must be carried on by steamers, and that then the Gulf of Darien will become the centre of nearly all the commerce of New Granada.

It appears that, in the course of the last year, two steamers, drawing 7 feet water, did ascend the river as high as Quibdo, the capital of Choco. British goods destined for that place are now sent round Cape Horn to the Bay of Buenaventura, and have to be carried thence on mules across the Andes.

Chile.—M. Plessis has completed his map of the province of Santiago de Chile, coloured geologically, a copy of which has been received by the Society, through the kindness of Mr. Bartholomew, who has engraved it.

Those who wish for the latest data on the geographical and other statistics of that section of South America will find them in the *Annuario Chileno*, a yearly publication which contains much useful local information, and in the *Anales de la Universidad*, another periodical, principally edited by M. Domeyko, a well-known geologist and good observer.

Peru and Bolivia.—Mr. Bollaert, our associate, has drawn attention to the existence of a statistical account of *Peru*, published in Lima by Don J. M. Cordova y Urrutia; as well as to a similar work on *Bolivia* by Don José Maria Dalence of Chuquisaca; both of which, if translated, he thinks might be useful to parties interested in those countries.

Rio de la Plata.—Lieut. Page's preliminary Report has been published '*On the Exploration and Survey of the Rio de la Plata and its Tributaries*,' noticed in Admiral Beechey's Address last year.

The United States' steamer Waterwitch was employed on the service in question for more than three years, during which the Paraná and Uruguay, the principal affluents of the Plata, were explored, and the river Paraguay ascended as high as the Brazilian fort of Coramba, in lat. 19° S. From that point the further progress of the vessel was not permitted by the ruling powers, much to the disappointment of Lieut. Page, who hoped to have led the way in opening a communication by steam for the first time with the rich provinces of Matto Grosso and Cuyaba, on the higher waters of this magnificent river.

There must, doubtless, be a great mass of new information to be collected respecting those countries which, under the Colonial rule of their old masters, were closed to all the rest of the world; and we cannot, therefore, but join in anticipating a rich harvest of interesting matter respecting them whenever the further details of the expedition shall be published in extenso, as no doubt they will be ere long, conformably to the liberal and enlightened practice of the Government of the United States.

It is, however, but due to others, when treating of this subject, to mention that the rivers Paraná and Uruguay have been already very carefully surveyed by our own officers, and that Captain Sulivan's admirable charts of them, upon a large scale, were long ago published by the Admiralty under the superintendence of that eminent hydrographer Sir Francis Beaufort.

Those rivers, as well as the Paraguay throughout its course, had been also previously mapped (and, it may be inferred, with some accuracy) by commissioners eminently qualified for the purpose, who had been chosen by the Courts of Spain and Portugal to settle and define their respective rights and limits, in virtue of the treaties of 1750 and 1777, and whose labours on the last occasion extended over a period of no less than twenty years.

The portion of them best known, perhaps, is that connected with Paraguay, in which every place of any importance was fixed by astronomical observation, as may be seen in the well-known work of Azara, who was one of the Spanish commissioners.

Copies of many of the maps of that part of this grand survey were purchased some time ago by the British Museum, and may be referred to in the MS. Department.

The most important result of Lieut. Page's expedition as yet made known, is the exploration of the River Salado, a tributary of the Paraná, with the evidence adduced of its being navigable in the greater part of its course through the upper provinces of the Argentine Confederation. This has been since verified to a considerable extent by the passage down the river of a boat from Matará,* in the province of Cordova, to Santa Fé, on the Paraná, under the personal guidance of Don Antonio Taboada, a brother of the Governor.

M. Amedée Jaques, a French gentleman, who joined Lieut. Page in his journey into the interior, to explore the course of this river, has published in the 'Revue de Paris' (last March) a highly graphic account of the personal adventures of the party, and of a bloody conflict they had with the wild Indians in the Chaco.

Coast of Patagonia.—Mr. Bragg, an English engineer employed at Buenos Ayres, has discovered and surveyed a good port and roadstead near the old settlement of the Jesuits, in the vicinity of Cape Corrientes, to the south of Buenos Ayres, which had hitherto escaped notice, but which is likely to be of some importance as a place of export for the produce of the adjoining districts. The details respecting it have been forwarded to the Hydrographer of the Admiralty.

Orinoco.—At the commencement of the present year, a proposition was laid before the Society by Admiral Sir Charles Elliot, late Governor of Trinidad, for the resumption of Humboldt's scientific investigations on the Orinoco and its affluents.

The prospective estimate formed by the illustrious philosopher of the advantages to be anticipated from the junction of the Tuamini, a branch of the Orinoco, with the Rio Negro, which falls into the Amazon, together with his more earnest advocacy of the importance of the navigation of the Meta, unquestionably place this suggestion in a very favourable light. The region drained by the vast water-system of the Orinoco is described by Humboldt as "enrichi des productions les plus variées;" and though we may no longer look for the fabled El Dorado of the adventurous Raleigh, the hope may yet be indulged that, by exploratory enterprise and the judicious application of steam navigation, a real El Dorado may yet be founded in this fertile portion of the western world. Nor can I here refrain from an allusion to the valuable edition by our distinguished medallist Sir Robert Schomburgk, formerly her Majesty's Commissioner to survey the boundaries of British Guiana, of the "Discovery of the Empire of Guyana by Sir Walter Raleigh," printed for the Hakluyt Society in 1848. Having himself explored what he describes as "the wondrous delta of the Orinoco," Sir Robert was able to enter, with the fullest intelligence and zeal, into the reproduction of those elegant descriptions by Raleigh which he had read with so much delight. These early narratives not only charm us by the quaint and nervous language in which the manly exploits of our ancestors are related, but frequently record discoveries or assert important truths which, from those distant times, lie dormant or are regarded as fictions, until accident or science unfolds anew, to the adventurer of the present day, the secret of their existence. I may mention, by way of illustration, an instance of the manner in which a fact of the greatest moment to the interests of the world may thus lie buried for more than two centuries and a half after its distinct announcement by one of our most distinguished early travellers. In the "World encompassed by Sir Francis Drake," edited for the Hakluyt Society by our associate Mr. Vaux, we find it said of California, which then received from Drake the name of Nova Albion, "There is no part of earth here to be taken up wherein there is not some speciall likelihood of gold or silver." This voyage of Drake's was made in 1578, and it was not till 1848 that the whole world was astounded by the discovery of the Californian goldfields.

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* Sir Woodbine Parish, in the first edition of his work on those countries eighteen years ago, mentioned that the Salado was known to be navigable as high as that place (Matará), and that if it were used, there would be an enormous saving of land carriage in the conveyance of goods from Buenos Ayres to Santiago in the interior.

Observatory of Santiago.—"The astronomical geography of positions (Baron Humboldt writes to me) has made progress through the useful establishment of the observatory of Santiago de Chile, founded during the residence of the able astronomer Lieut. Gilliss, of Washington. The Director of the Observatory of Santiago, M. Moesta, has found the difference of longitude between Santiago and Greenwich 4h. 42′ 32″·4 in time, probable error 3″·2.

"M. Moesta thinks, that all the west coast of South America is 17″ too much to the west on the best maps. I had found that Callao de Lima was 5h. 18′ 16″ west of Paris by the passage of Mercury over the solar disc; now Admiral FitzRoy finds the difference of longitude between Valparaiso and Paris 4h. 50′ 6″·6; and that between Callao and Valparaiso by means of chronometers 0h. 22′ 8″·4; so that Callao would be 5h. 18′ 15″ west of Paris, which coincides to within one second of time with the result of the observation of the passage of Mercury observed by me—an accuracy probably accidental. Admiral Beechey has repeated the calculations of Heiz and

FitzRoy, showing that the difference of longitude in time between Valparaiso and Paris is 10″·4 in excess. Callao, therefore, would be only 5h. 18′ 4″·6 to the west of Paris. The passage of Mercury. however, over the solar disc, which was observed on the 4th of May, 1832, at Lima by Mr. Scholz, again gives for Callao 5h. 18′ 13″·7 west of Paris—supposing the chronometrical differences between Lima and Callao, which I published in the second volume of my Astronomical Observations, to be correct. The electric telegraph, established in May, 1855, has given 0h. 3′ 56″·5 for the difference of longitude between Valparaiso and Santiago. M. Moesta, therefore, places Valparaiso in 4h. 55′ 49″·5; and I and FitzRoy 4h. 56′ 6″·6."

After this clear and succinct analysis of so valuable a geographical datum, obtained through an expedition of the United States, the veteran philosopher concludes in these words: "And thus this long endurance of life (cette patience de vivre) has enabled me to witness all these rectifications." *

In looking to the general configuration of South America, I am further reminded by Baron Humboldt, that the trachytic regions form insulated bands in the Cordillera, such as the volcanic Sangai, to the S.E. of Quito, which is constantly throwing out incandescent scoriæ, like those of Stromboli. This insulated trachytic mass, which has a diameter of 45 English miles only, rises out of a granitic and gneissose plateau 16,070 French feet above the sea, thus presenting an analogy to the structure of the Thian Chan in Central Asia.

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* Having been made acquainted by my friend Mr. Pentland with data respecting Admiral Beechey of which I was ignorant, it is due to the memory of my lamented predecessor to state, that in a letter to Admiral Krusenstern, he fixed the longitude of Valparaiso by independent astronomical observations at 4h. 46′ 37″ 6‴, only differing 8″·6 from that deduced by Moesta's observations; and as the latter are probably 3″·7 in error, it follows that there may be little more than one mile between his result and that of Admiral Beechey.[a]

The position adopted on the Admiralty Charts, and in Lieut. Raper's elaborate Tables of Positions, has been deduced solely by means of chronometers during Admiral FitzRoy's surveys; the latter officer having made few absolute astronomical observations; whilst his chronometrical data are entitled to the greatest degree of confidence.

I am also informed by Mr. Pentland, that he having made independent observations, similar to those of Admiral Beechey (moon culminating stars) at stations referred trigonometrically and chronometrically to places on the coast, he found for the latter, longitudes agreeing with those deduced from the position of Valparaiso, as determined by my distinguished predecessor. Thus the position of Arica deduced by Mr. Pentland from observations made at La Paz, and carried on by a series of triangles and chronometers to that place, is identical with that deduced from Beechey's longitude of Valparaiso carried on by FitzRoy's chronometrical chain to the Peruvian port.—R. I. M.—1st Aug. 1857.

[a] See Journal R. G. S., vol. ix. p. 502; also Daussy's Positions Géographiques, 1842, p. 67, &c.—ED.

FINAL ARCTIC SEARCH.

When I last addressed you as your President in 1853, it was still my hopeful task, as in the previous year, to urge the Government and the country to send out another expedition in search of my old and honoured friend Franklin and his crews. I then congratulated you upon fresh expectations having been raised by the successful voyage of Lady Franklin's little vessel, the Isabel, under Inglefield, and also in anticipation of good results from the large public expedition under Belcher and Kellett. Alas, we know too well what fatalities interfered with the solution of the great problem, so clearly recorded last year by my lamented predecessor. Since this Address was delivered, the light which had been thrown upon the subject, whether by the information and memorials brought home by Dr. Rae, or the exploration down the Back River by Dr. Anderson, has rendered me still more anxious to ascertain the real fate of the Erebus and Terror, and their gallant crews. Through the unexpected tidings communicated by our medallist Rae, we were no longer allowed to speculate on the course followed by Franklin; the "whereabouts" of the journeyings of some, at least, of our missing countrymen being for the first time made known. Had these traces been discovered two years sooner, what efforts would not have been saved to Great Britain and America! All the endeavours of Belcher and De Haven to penetrate northwards by Wellington Channel, as well as those of Kellett to communicate by a north-western course with Collinson and McClure, and the almost superhuman struggles of Kane to reach a Polar basin—all these might have been averted! The daring efforts to penetrate with ships through the intricate channels which separate the great islands of the Arctic Archipelago, would have been stopped by that one fact, and the Government would have known how to dissipate at once the mystery which still hangs over the fate of the missing vessels and a large portion of their crews.

Is it, therefore, to be wondered at that many men of science willingly signed a memorial,* beseeching the Government to make a final endeavour to search efficiently the area, at the edges of which the relics were discovered, and where the Esquimaux reported, that some of the wanderers were last seen? I regret to say that notwithstanding the kind consideration of the Prime Minister, and the hopes we were led to entertain, the limited search asked for has been withheld, and Lady Franklin has once more been thrown upon her own resources, to terminate that inquiry which my friends and associates felt it to be the duty of the nation to complete.

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* This document, which was prepared by myself, the list of subscribers being headed by Admiral Sir F. Beaufort and General Sabine, was most kindly received by Lord Palmerston in June, 1856, a month after the last Anniversary of this Society. My predecessors, Lord Ellesmere and Admiral Beechey, were among the subscribers, as well as Lord Wrottesley, who in his last Anniversary Address to the Royal Society handled the subject with great effect. *See* Proc. Roy. Soc., No. IV.

The intense feeling displayed on this subject by our kinsmen the Americans, has been demonstrated by the strenuous efforts made by their Government as well as by Mr. Grinnell. In 1853 I rejoiced with you in learning, that this liberal philanthropist was about to renew with his own funds another Franklin search, and that Kane was about to sail on such a voyage. That noble young man, as I have already shown, extended far the northern limits of Smith Sound, at the head of Baffin Bay, and opened out headlands, glaciers, and frozen seas, hitherto unknown to us. This search and all the other trying endeavours were, we now know, made in wrong directions.

If, for example, Collinson had not made extraordinary efforts to force his way to the north-east through packs of ice, but had simply confined his voyage to the channel along the north coast of America, which he found so easy to follow, and by which he brought his ship safely back, and had known that the tract near King William's Land and the mouth of the Back River, the edges of which he actually touched, formed the goal we now desire to reach, the problem would have been for ever solved by him. If, then, there is no obstacle to a renewal of the western route, by Behring Strait and the north coast of America, what difficulty can there be in reaching the north-eastern edge of the limited area sacred to the memory of Franklin, by a ship proceeding to Batty Bay or Wager River, places which our vessels have already reached, and whence they have also returned unscathed? The instructions of Lady Franklin to Capt. Kennedy, the Commander of one of her private expeditions, were, that on reaching that tract where poor Bellot has left his name, a search was to be made south-westwards; and had the suggestion of that clear-sighted woman been followed, she would really have been the first to discover, by her own efforts, the remnants of her husband's expedition.

An ingenious essay, by Mr. Findlay, on the probable course pursued by Sir John Franklin's expedition, which was published in the last volume of our Journal, and in which the directions of the Arctic currents are delineated, has sustained the idea which I once thought possible, but afterwards abandoned, that the two ships seen floating on an iceberg on the Newfoundland Banks may have been the Erebus and Terror. The same author has recently published an Appendix, in which, supporting his view by letters from parties well acquainted with the seaman who made the observation, he also gives a letter from Captain Ommaney, expressing his concurrence in the same view. With every respect for the opinions of such contemporaries, I cannot yet admit, that the vessels seen floating southwards may have been the Erebus and Terror; nor can I see why they may not have been other vessels. But even if it be granted that the question is to be thus disposed of as respects the ships, it is consolatory to find, that both Captain Ommaney and Mr. Findlay strongly advocate a renewed search, to dispel our ignorance of the only region, whose exploration can solve the great Franklin mystery. Whatever may be thought of Mr. Findlay's view of Peel Sound being closed to the south, his suggestion, that the unexplored tract between the south end of Melville Sound and Victoria Strait is the area, which ought specially to be searched, is entitled to the serious consideration of all those who continue, like myself, to take a lively interest in the solution of this problem, and who are bent upon ascertaining, by positive survey, whether no traces of the ships or their records can be found, and also to satisfy us that no survivors are eking out their existence among the Esquimaux. On this last point I can never forget what I heard from the lips of Captain Hartstene himself. After our Sovereign had in December last visited the Resolute, that token of the good-will of the American people, the British Queen inquired, with the right feeling which is her characteristic, if he thought that any of her poor sailors might be still alive, and the gallant officer assured Her Majesty that, in his opinion, such might well be the case.

A strong tendency towards this belief, has indeed gained much ground since the publication of the admirable volumes of Dr. Kane. One passage from that work has been already cited in the brief tribute I have paid to the eminent man, who, when he was himself in dire want and had unexpectedly procured some fresh supplies of animals, thus exclaims: "How can my thoughts turn despairingly to poor Franklin and his crew? . . . . Can they have survived? No man can answer with certainty, *but no man, without presumption, can answer in the negative.*" . . . . "Of the one hundred and thirty-six picked men of Sir John Franklin in 1846, Northern

Orkney men, Greenland whalers, so many young and hardy constitutions, with so much intelligent experience to guide them, I cannot realize that some may not be yet alive—that some small squad or squads, aided or not aided by the Esquimaux, may not have found a hunting ground."

On this subject there has truly been much misapprehension in the mind of the public, owing to their ignorance of the geographical data on which hope is founded. The area within which some of the crews of Franklin were last seen, though much further to the south than the wild islands and headlands of the Arctic Archipelago, in which the Resolute and her companions were abandoned, and though easily and safely approached by sea, either from the west or east, is hopelessly cut off from all land furnishing the necessaries of life, by a broad, cold, and sterile region, occupied by a few wretched natives. The individuals of Franklin's expedition who might have survived, if located to the north among the Esquimaux who fatten upon seals and walruses, could by no possibility track their way southwards over these wilds, on which even the reindeer finds no sustenance. It is chiefly in the meridians on either side of the Back River that this sterility prevails; and here it was that Franklin and his former companions, Back and Richardson, suffered so intensely in 1824, that their existence was then nearly terminated.

With such a wilderness between them and any home, the exhausted crew of Franklin, contemplating nothing but starvation in that sterile icy region of central North America, would naturally, as Kane has suggested, seek a refuge among the Esquimaux, in some chosen spot where animals abound.

When we know from the declaration of a highly respectable seaman still living (one indeed of the crew of Parry),[*] that he was on the point of embracing the life of those savages, merely for the allurements of the chase and the wild attractions it offered, we can well imagine that those who were left of Franklin's noble crew, should, according to the dictates of nature, endeavour in like manner to prolong their existence. Let it therefore be impressed on the public mind, *that although the area, on the southern edges of which some of Franklin's people were last seen, has been approached and can be easily again visited by ships, it has never yet been examined:*[†] *and also, that though it be to the south of many tracts formerly penetrated, yet is it so cut off by impe-*

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[*] *See* 'Times,' December 20, 1856, Letter from Mr. John Pead to myself.

[†] Montreal Island, which has alone been visited, is incapable of affording sustenance even to Esquimaux.

netrable wilds from the nearest parts of North America, in which food can be obtained, that by no exertion could any survivors of the Erebus and Terror be saved except by sending out a well-found ship or ships to the points nearest to such insulated Esquimaux quarters.[*]

As you are all acquainted with that appeal already mentioned, which my friends and myself thought it our duty to make to our countrymen on this exciting topic, I am sure you will rejoice with me, that the charge of the expedition, which Lady Franklin has resolved to send out, should have been undertaken by the eminently distinguished Arctic explorer, Captain M'Clintock. Commanding a thoroughly adapted screw yacht, the Fox, assisted by a well-qualified Polar associate, Lieut. W. R. Hobson, with Dr. D. Walker as the surgeon, and provided with a picked crew, this gallant officer will realize all that a firm resolve, a clear head, and skilful calculations can effect.

Let it also be recorded in our volumes, that amid the many generous Englishmen who have responded to the call, the name of Captain Allen Young, of the Merchant Service, stands pre-eminently forward; since this meritorious young seaman, who has already commanded large ships in various seas, has not only volunteered his services, under the command of M'Clintock, but has actually subscribed 500*l*. towards the expense of the expedition in which he sails.* May God, therefore, crown their efforts with success! and may M'Clintock and his companions gather the laurels they so well merit, in their noble endeavour to dissipate the mystery which shrouds the fate of the Erebus and Terror and their crews!

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[*] Proposals were made by Lieutenant Bedford Pim and Dr. King to combine a land or river journey with maritime exploration; the former having, indeed, communicated previously a long memoir on the subject to the Geographical Society. Applauding those experienced men for their laudable endeavours to rouse public sympathy to continue the search, and reminding my associates that Dr. King accompanied Franklin in a former voyage, and that Lieut. Pim was highly commended by myself and others, not only for his Arctic researches, but also for his devotion to the cause in proposing to reach the supposed scene of disaster, by traversing Siberia, followed as it was by his march across the ice of Banks Sound to rescue M'Clure,—still, looking to the slender results of the recent land-expedition down the Back River, though carried out with all possible energy by Mr. Anderson, I cannot bring myself to believe that the renewal of any such enterprise can have a satisfactory issue. In fact, as we now know it to be impracticable that an exploring land and river party can convey more food in their canoes than will just enable them to make a hasty and wholly ineffectual search near the mouth of the river, all efforts to explore the adjacent northern tracts where those Esquimaux are chiefly living, among whom some of the missing navigators were heard of, must cease just at the moment and on the ground where they ought to be pursued. No exertions, in short, save those which can be made upon the ice by vigorous men proceeding from a well-supplied ship, can succeed in really ascertaining the fate of the crews of the Erebus and Terror. Other memoirs, suggestive of different plans for the most effective search after the relics of the Erebus and Terror, have been recently sent to the Society; thus evincing the great interest still taken by the public in the settlement of this question. These memoirs are: 'On the Discovery-ship Resolute and the Arctic Currents,' by M. Turnbull; 'On the Search for Sir J. Franklin,' by Chief-factor Anderson, communicated by Sir John Richardson; 'Plan of a Search for Franklin Expedition,' by Dr. R. M'Cormack; 'Plan of a future Search for the lost Franklin Expedition,' by James Parsons.

If, however, this last effort which, in the absence of other aid save that of her friends, Lady Franklin is now making, should fail in rescuing from a dreary existence any one of our countrymen, and should not even a plank of the Erebus and Terror be discovered —still, for her devotion in carrying out this examination of the unvisited tracts wherein, we have every reason to believe, the ships were finally encompassed, every British seaman will bless the relict of the great explorer, who has thus striven to honour the memory of her husband and his brave companions.

My earnest hope is, that this expedition of Lady Franklin may afford clear proofs that her husband's party came down with a boat to the mouth of the Back River in the spring of 1850, as reported on Esquimaux evidence by Dr. Rae, and thus demonstrate that which I have contended for, in common with Sir Francis Beaufort, Captain Washington, and some Arctic authorities, that Franklin, who in his previous explorations had trended the American coast from the Back River westward to Barrow Point, was really the discoverer of the North-West passage!

In wishing then Godspeed to this private expedition, as I did to all the previous efforts of Lady Franklin, far be it from me to underrate the zealous endeavours which successive Administrations have made during a series of years, whether to extend geographical knowledge and determine a north-west passage, or more recently to rescue Franklin and his crews —endeavours which will be recorded as among the great glories of Britain, in having brought forth in striking relief the characters of some of the ablest of our seamen, who, formed in that school of severe trial, have proved to be leading men in the late war. These British worthies have now been appropriately rewarded by having had conferred on them their hard-earned Arctic medals; and I only regret that their noble feats should not, for the honour of the nation, have been terminated by one exhaustive public effort.

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* I am happy to announce that, whilst these pages were passing through the press, Petersen, the Esquimaux interpreter, well known to all the readers of the voyages of Penny and Kane, having returned from Greenland to Copenhagen, has, through the instrumentality of our distinguished foreign member Captain Irminger, Royal Danish Navy, and a telegraphic communication from myself, travelled through London and reached Aberdeen in time to join Captain M'Clintock. The Fox sailed from that port under Lady Franklin's eye on the 1st July, the whole party on board in the highest spirits.—*July* 4, 1857.

My admiration of these voyagers has indeed been recently enhanced, by the ardour and sincerity with which so many of them have offered their services, to continue the search after the relics of the Erebus and Terror. Such men are truly worthy of any distinction which their country can bestow, and all geographers must agree with me in regarding the Arctic medal which they wear, as an honour second to none which the Sovereign can confer.

Conclusion.

In bringing this discourse to a close I have now only to congratulate my associates on the steady rise which this Society has made in the estimation of the public, and on the vast accession to its members in the last few years. Commencing in a striking manner under the guidance of Admiral Smyth, and increasing during the successive Presidencies of myself, the Earl of Ellesmere, and Admiral Beechey, the augmentation has so continued, that we now nearly double the number of members at which we stood during many years.

Besides the vast augmentation of our Map Office, another distinctive feature in our recent progress has been the periodical publication of our Proceedings, which, whilst they record the doings and sayings at our evening meetings, sustain the spirit of the Society, and serve to keep the members, who have been unable to attend our meetings, well acquainted with the passing events.

Putting forth the substance of what is spoken as well as read, these periodical reports impart vitality to our Society, and will in future times be consulted with interest, as expressing the current opinions of British geographers and travellers "de die in diem;" a result for which we are mainly indebted to our able and zealous Secretary, Dr. Norton Shaw, who, in addition to the editorship of our Journal, has recently taken upon himself the whole of the editorial duties connected with this new publication.

Whilst the masses of our countrymen, it must be admitted, are better pleased with the news of the day, than with scientific discussions, many of the topics of which we treat are so popular, as well as important, that an enlightened portion of the press merits our best thanks for endeavouring to do justice to the promotion of those geographical researches in which we are embarked. It would be truly surprising if this were not so amongst Englishmen, whose colonies extend to the Antipodes; and who have, therefore, more grounds than any other nation, for making themselves well acquainted with the surface of the earth, its productions, and inhabitants. I rejoice then to see that our numbers have so increased since my last Presidency, that adequate as we then thought the present apartments would prove for our wants, we already find that they will not by any means contain our members. Assisted, however, by Her Majesty's Government with an annual grant for keeping up a public Map Office, and enjoying a good balance at the banker's, there can be no difficulty in remedying this temporary inconvenience; and when the next Anniversary arrives, I trust that we shall be assembled in halls well adapted to accommodate us, including those ladies also who, following the example of their illustrious countrywoman, Mrs. Somerville,* take a deep interest in geographical science; for there is nothing more encouraging than to see the fair sex gathering information amongst us, to be by them communicated to the sons of England.

At the same time, whilst we maintain our popularity, we must render our annual Journal as far as practicable, not merely the exponent of interesting travels, but also the index of the progress of physical and comparative geography strictly so called, since we reckon amongst our associates, men who are competent to realize every wish to which the scientific geographer can aspire.

In thanking you, Gentlemen, for your friendly support, let me say, in conclusion, that when I undertook to stand in the breach occasioned by the death of my gallant friend Admiral Beechey, I did so under the persuasion that I could not execute more than one session of labour, considering that I had other scientific and official duties to perform. Feeling, however, that I may still be able to serve you for another year, I have, in compliance with your flattering request, consented to retain that which I consider to be as distinguished and useful a post as a man of science can occupy.

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* In announcing that a new edition of Mrs. Somerville's remarkable work on Physical Geography is about to appear, I am happy to be able to state, that whilst we are taking measures to secure a permanent meeting-room, the Senate of the University of London and the Council of the Royal Society have acceded to the request of the Council of our Society, and have granted us the use of the large rooms at Burlington House for our ordinary meetings during the ensuing Session.—*July* 12, 1857.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

SESSION 1857.

Thirteenth Meeting (ANNIVERSARY), 1 P.M., *May 25th*, 1857.

The President, SIR RODERICK I. MURCHISON, in the Chair.

The Minutes of the previous Meeting were read and confirmed. The Regulations respecting the Anniversary Meetings were next read, when the President appointed William Bollaert and John Brown, Esqrs., Scrutineers for the Ballot.

The Report of the Council, with the Balance-sheet for 1856, and the Estimate for 1857, was then read and adopted.

The PRESIDENT next delivered the Founder's Gold Medal to the Right Hon. H. Labouchere, Her Majesty's Secretary of State for the Colonies, on behalf of Mr. Augustus C. Gregory, Commander of the North Australian Expedition, for his explorations in Northern and Western Australia.

The Patron's Gold Medal, awarded to Lieutenant-Colonel Andrew Scott Waugh, of the Bengal Engineers, Surveyor-General of India, for his geodetical operations and triangulation of that country, was delivered to Colonel George Everest, F.R.G.S., etc., for transmission to Colonel Waugh.*

The PRESIDENT then read his Anniversary Address, for which a unanimous Vote of Thanks was passed, with a request that he would allow it to be printed.

The Ballot being concluded, the Scrutineers reported that the changes advised by the Council had been adopted; and the President announced the two vacancies in the offices of Vice-Presidents, occasioned by the deaths of Rear-Admiral F. W. Beechey and the Earl of Ellesmere, to be supplied by Colonel G. Everest and Sir Walter C. Trevelyan; the vacant Honorary Secretaryship to be filled by Francis Galton, Esq.; and those in the Ordinary Councillors produced by the retirement of Lord Colchester, Sir Charles Fellows, Rear-Admiral FitzRoy, William J. Hamilton, Esq., the Earl of Harrowby, Colonel J. E. Portlock, and the Earl of Sheffield, to be filled by Lord Broughton, Captain Collinson, R.N., John Crawfurd, Esq., H. Raper, Esq., R.N., Colonel Sir H. Rawlinson, and Major-General Sabine, R.A.

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* For these Awards and the President's Address *see* No. X.

The Thanks of the Meeting having been voted to the President, Vice-Presidents, Members of the Council, Auditors, and Scrutineers, the President finally directed the attention of the Meeting to the usual Anniversary Dinner, and the Meeting adjourned at half-past 3 P.M.

Fourteenth Meeting, June 8th, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Major-General A. Alexander, Mr. W. H. Hovell, and Mr. R. Sweeting, were presented on their election.*

ELECTIONS.—*Commander R. D. Aldrich,* R.N.; *Rev. G. R. Gleig; Capt. F. Hughes, Madras Cavalry; Colonel the Hon. J. Lindsay; Capt. A. P. Ryder,* R.N.; *Capt. Allen Young; and Messrs. A. C. Blackstone; Cornwallis R. Cartwright; John Dobie, Surgeon,* R.N.; *Edward John Eyre, Lieut.-Governor of St. Vincent's; Samuel Gurney,* M.P.; *Abel Smith; Horace Smith; Philip Smith; and Henry White, were elected Fellows.*

DONATIONS.—The following were among the donations to the Library and Map-Rooms received since the previous meeting:—'Maps of the Crimea, Erzrum, Khiva, &c.,' published by the Topographical and Statistical Depôt of the War Department; eight sheets of the Admiralty charts of the Delta of the Danube; Sir John Davis' 'China;' The Transactions of the Franklin Institute of Philadelphia; of the Academy of Sciences of Paris; of the Zurich Natural History Society, &c.

EXHIBITIONS.—Among the articles exhibited were fragments of ancient pottery found on Serpent Island by Capt. Spratt, R.N.; an original plan of Alexandria, by Capt. Mansell, R.N.; and maps of St. Miguel and Caledonia Bays, &c., by Mr. Lionel Gisborne, F.R.G.S.

ANNOUNCEMENTS.—The President announced the return of Dr. Elsey, F.R.G.S., the surgeon of the North Australian Expedition; of Mr. A. W. Twyford, recently attached to the Egyptian Nile Expedition; and also of Sir Robert Schomburgk, F.R.G.S., from the Consulate of Samana, in St. Domingo, *en route* to that of Siam.

The Papers read were :—

1. *On the Battles of Sellasia, Marathon, and Thermus.* By Lt.-General JOCHMUS.

GENERAL JOCHMUS explained that these papers had been written in Greece, between the years 1830 and 1834, when he was Aide-de-camp to General Sir Richard Church, Commander-in-chief of the armies during the war of Greek independence; or later, when he was employed as a captain in the Greco-Bavarian service, at Athens. The above manuscripts had been presented to the Royal Geographical Society in 1853, together with others,* written in English, which have already been published by the Society; but the present manuscripts required translations from the French and other preparations prior to being printed. In referring to, and commenting on the eight maps which accompany the above manuscripts, General Jochmus pointed out how the ancient geography of some districts in Greece was elucidated by commentaries like these on the old military operations in those countries, and *vice versâ*, how the study on the spot of those military operations had assisted him in determining, amongst others, the sites of Thermus and of Metapa (Polybius, lib. 5), the site of Marathon (already identified before him with the position of modern Vranà by Colonel Leake), the probable extension of the Greek and the Persian lines of battle, and the number of troops engaged at Marathon (Herodotus, Plutarch, Thucydides, &c.). General Jochmus further showed how he had determined the sites of the ruins of Sellasia, its subterranean spring mentioned by Pausanias, and of the battle-field † between Antigonus and Cleomenes in its immediate neighbourhood. It was also stated how he happened to discover in 1834 the sites of all the places and monuments mentioned by Pausanias in his description of the road from Argos to Sparta, viz. the Ruins of Caryae, the Trophy of Hercules, the Temple of Jupiter Scotitas, the Statue of Apollo at Thornax, &c. Finally, General Jochmus, by referring to the eighth map representing a part of Laconia and Cynuria, showed how he had been enabled to trace thereon the following military positions and operations :—1st. The Camp of Epaminondas advancing against Sparta after the battle of Leuctra; 2nd. Philip in order of battle opposed to the Spartan army, after the fight on the Menelaïon; 3rd. Battle field of Sellasia; 4th. Philopœmen in ambuscade in the forest of Scotitas; 5th. Philopœmen encamped at Barbosthenes before the battle against Nabis, A.C. 192; 6th. Titus Quinctius encamped at Caryae, A.C. 195; 7th. Philopœmen at Caryae, A.C. 192. (*See* Pausanias, Xenophon, Livy.)

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* A Journey into the Balkan, and Comparative Commentaries on the Marches of Darius, Alexander, and Marshal Diebitch, between the Danube and the neighbourhood of Constantinople; also, Notes on the Water Communication in Asia-Minor.

† B.C. 221.

The PRESIDENT expressed the thanks of the Society to General Jochmus for his communication. Although a period of twenty-five years had elapsed since the General visited these spots, yet he had described them with all the freshness of his youth, and had given such a clear account of them that, with the aid of the large and graphic charts exhibited, every one might have followed him. They were much obliged to General Jochmus for having, as a practical soldier, described these ancient positions. It should not be forgotten that we were glad to receive such valuable contributions on comparative geography; as the objects of the Society were not confined to the cultivation of physical geography and the exploration of unknown countries.

The BISHOP of ST. ASAPH, F.R.G.S., said there was one point of view in which he thought communications of this kind peculiarly valuable—and that was that they verified history. In this instance, after nearly 1500 years, a military man, an able judge of the matter, went upon the ground and found all the details such as they were described in history. The value of that fact, to his mind, was this—that it gave a person a confidence in history which nothing else could provide. This was peculiarly the case with respect to the Holy Land. The investigations that had taken place in that land had every one of them proved the truth of sacred history. It was so many years since he had studied these matters, that he was not able to speak to the details of General Jochmus's communication; but he was fully aware of the extreme value of a soldier's investigating military matters, and reporting them to scholars, who were able by comparison with ancient history to prove that history true.

MR. GEORGE BRENT, F.R.G.S., said that, as he had been entrusted by the Secretary with the duty of revising the translation of General Jochmus's papers, it might be proper that he should say a few words. He had found the task one of pleasure; the papers were written with learning and taste, and, moreover, in excellent French. One thing which forcibly impressed him was the great advantage there was in examining localities mentioned by ancient authors with the book of the author in one's hand, as had been done by General Jochmus in this instance. The advantage was most obvious. Had the same plan been pursued by modern authors, instead of theorising at a distance, with the aid of very imperfect maps, many doubts and difficulties would not have existed with reference to the writings of ancient authors, which did exist in the present day. In going through the manuscripts, another circumstance which struck him was the correct appreciation the General had of the labours of Colonel Leake, whose researches in Greece had placed him in the first rank of comparative geographers. Wherever General Jochmus had found occasion to dissent from Colonel Leake, he had stated his views and opinions with so much candour and exactness, that they could not be without their weight upon the mind of the Colonel himself. Another idea which had forced itself upon his attention was, the great advantage which would accrue if any of the Fellows of the Society, who had leisure at their command, would in the same way examine localities in our own country having reference to military actions which took place in dark periods of our history, of which we had only obscure notices, and ascertain the real truth of the matter—which could only be done by observations upon the spot. If it were true that the earth was interesting as the abode of man, surely those spots on its surface which had been the scenes of events that had materially affected the destinies of our race, must be among the most interesting portions.

Mr. Charles Bracebridge, F.R.G.S., begged to make one observation. It was that the late Dr. Arnold, upon receiving from him a Map of the Morea, drawn up after the survey of the French, made the very natural, but perhaps not known, observation that, until this map came into his hands, he did not understand the wars of Greece. It was well known that Dr. Arnold was for many years occupied in writing comments on the history of Greece, and such was his appreciation of that beautiful survey, which had made us acquainted with the ravines, the heights of mountains, the ancient causeways, the tracks of commerce, and the topography of different localities. He believed that some of these spots—the plains of Argos, for instance—no scholar could comprehend, unless he saw the beautifully illustrated map made in that survey of the Morea.

The President said, as reference had been made to Colonel Leake, he begged to state that the communications of General Jochmus had been submitted to that accomplished scholar, who had strongly recommended their publication.

The second Paper read was—

2. *Remarks on Serpent Island.* By Capt. Th. Spratt, R.N., C.B.

[This Paper has been directed to be published in the Journal.]

The President observed that the distinguished nautical surveyor, Captain Spratt, whose papers on different parts of the adjacent coasts had been read at various times to the Society, had given a very clear account of this singular island. As a geologist he might say that, if the structure of rocks was to be the ground for the construction of empires, Serpent Island being of the same composition as the adjacent provinces, the question recently agitated might at once have been decided.

Mr. W. J. Hamilton, F.R.G.S., as an old friend of Captain Spratt, and having given him his first lesson in geology in the neighbourhood of Smyrna, took great interest in anything Captain Spratt said upon the subject. The various papers, he had read before the Geological Society, were quite enough to show that he had made very rapid progress in that science. With regard to the observation made by the President, if the question of political configuration was to be decided by geological constitution, he believed this island would be found to form a sort of connection between Bulgaria and the Crimea.

The third Paper read was—

3. *On the Hydrography of the Valley of the Arve.* By Professor Paul Chaix, of Geneva, Corresponding F.R.G.S.

Addressed to the Secretary.

[This Paper has been directed to be published in the Journal.]

The President said that Professor Chaix's communication was one of value, more particularly with reference to the changes in physical geography produced by modern causes; and also to geologists, in forming their calculations as to what must have passed in vast periods of time.

The fourth Paper read was—

4. *A Notice of a late Exploration of Darien.* By Dr. H. C. CALDWELL, of the U. S. frigate Independence.

Communicated by JOHN POWER, Esq., F.R.G.S., of Panama.

During an official expedition made towards the end of last year to the Gulf of San Miguel, for the purpose of reporting on the facilities of obtaining lumber suitable for ship building, Dr. H. C. Caldwell, surgeon, U. S. ship Independence, who accompanied it, met with Mr. Andrew Hoseac of Chepigana, from whom he learned the particulars of the explorations made by Dr. Cullen, Mr. Gisborne, Capt. Prevost, R.N., and Lieut. Strain, of U.S.N., in 1853, and also that, in Mr. Hoseac's opinion, based upon information derived from the Indians, there existed a comparatively level tract of land between Fort Principe, on the Savanna river, and Caledonia Bay, on the Atlantic, in a direction *more northerly* than that followed by Capt. Prevost, of H. B. M.'s ship Virago, in 1853.

On his return to Panama, Dr. Caldwell obtained from Commodore Mervine leave of absence for three weeks, and, accompanied by a sailor from the Independence named Parker, set out with the intention of exploring this new route. Having reached Chepigana, every assistance was rendered to him by Mr. Hoseac, but the greatest difficulty was experienced in procuring men to accompany him; all giving as an excuse their dread of the Indians, &c., &c. At last, an Indian to act as interpreter, his nephew, a lad of fourteen, and a negro, were prevailed upon to go; and on the 5th of April the party started from Chepigana and reached Principe on the morning of the 6th.

The next day, the party started in a northerly direction, cutting their way through a thick undergrowth of palms, vines, and thorny bushes; the bed of the river was crossed during the day four or five times—an insignificant stream running in a watercourse 20 to 30 yards wide. Captain Prevost's track was also crossed, the cutting through the bush being still distinguishable; and on a tree was found cut the words, W. JONES, VIRAGO, DEC. 1853. The distance travelled this day was estimated at about six or seven miles, and an elevation was reached of about 160 feet, as near as it was possible to judge without measurement. For the next three days the country crossed still continued to be thickly wooded, of a gently undulating or almost level character, intersected in different directions by numerous watercourses, and in some parts the ground seemed to be swampy during the rainy season. On the fourth day two shots were heard, apparently quite near, and said to be from some of the

Indians on the Atlantic side; marks of a trail were also seen, and also a tree recently cut. The whole party suffered much for want of water, which was very scarce, and in hunting for which much delay was caused. The negro peon, being in fear of the Indians, persuaded the Indian interpreter and boy to return, and neither threats nor promises could induce him to proceed. At evening on this the fourth day the Atlantic was seen from the top of a tree, through a gap in the hills, in a N.E. direction, apparently about 10 miles distant. The following morning (the fifth day) the Indians and negro retraced their steps, and Dr. Caldwell and Parker continued their route, cutting their way with much difficulty through the bush, and suffering still from want of water. Two more shots were heard in the woods this day.

Towards evening, on ascending a tree, the gap in the Atlantic range was again distinctly visible, distant about five or six miles; but the want of water and provisions compelled the Doctor to return, and on the morning of the eighth day he reached Principe, where he fortunately found the Indians and negro with the canoe, they having, in the mean time, returned to Chepigana, whence they had been compelled by Mr. Hoseac to go back and await the arrival of the party.

Dr. Caldwell believes that the summit between the two oceans was crossed on the *first* day's march near Principe, and that thence to the Atlantic there was a gradual descent. This agrees with the accounts furnished to him by various Indians in Chepigana and Yavizo, especially with regard to the gap through which the Atlantic was so distinctly visible.

This route Dr. Caldwell considers well worthy of being scientifically examined, and he expresses no doubt of his being able, by following the path he has cut, to reach the Atlantic from Principe in four days at the outside. Not having taken any instruments with him, Dr. Caldwell does not profess to give more than an approximation to the heights and distances.

MR. L. GISBORNE, F.R.G.S., had been twice to the Isthmus of Darien, and he had heard the paper with great interest, because it showed that the author had fallen into the same error that he (Mr. Gisborne) had, on his first visit. The only difference was that he did not fall in with Indians. Dr. Caldwell stated that, on the fourth day, he saw the Atlantic. The Society had in their archives his own report on the last expedition to the isthmus of Darien. It was undertaken at the request of the three Governments of France, England, and America, and with the consent of the Government of New Granada, and he might, therefore, call it an official survey. They found out for the first time that the whole coast on the Atlantic was eight miles out of longitude—an error so important, that another explorer of Darien, Captain Prevost, who, he believed, was the first that went so far into the interior, starting from the same place that Dr. Caldwell did, with the best Admiralty maps before him, and intending to proceed to the east coast, found that he was steering towards a point really 25 miles to the north of it; the geographical error in the position of Caledonia having misled him that much. This error was corrected by the surveys which were undertaken in 1853. With respect to Dr. Caldwell's paper, all the information he had collected was evidently wrong. The summit of the range was within five or six miles of the Atlantic; and that range consisted of mountains from 900 to 1000 feet high. There was a map upon the table, the official map sent there from the Admiralty, which showed the different heights taken by instrumental observations, with spirit levels, or mountain barometers. As to a ship-canal across *this* portion of the isthmus, he (Mr. Gisborne) really considered it to be an absurdity. The ridge was like a backbone. He had walked along the top of it for miles and miles together, and it was so narrow that few men could walk along it abreast.

The PRESIDENT.—Is there not any point of depression?

MR. GISBORNE.—There is none. The sources of all the rivers were from 500 to 700 feet above the level of the sea; it was, therefore, impossible to suppose that there could be any break in the mountains below 700 feet. That alone would render the question of a canal in this spot impossible. He had levelled the range instrumentally and barometrically, and there was no point in it that was less than 900 feet high. This might be taken as an established fact. He had also made a survey of the Caledonia, with the object of following the traces of the Americans, who, under Lieut. Strain, were upon that river in a state of starvation. He had with him a copy of a map of the river, made by a Spanish officer 130 years ago, and the survey made by himself placed a position within a short distance of the spot where the Spaniards had placed it so many years before. Now that his own surveys had been completed, and the report placed in the possession of the Society, he hoped they would let it go forth to the world that a ship-canal across the Isthmus of Darien, as far as geographical difficulties were concerned, was perfectly impossible.

Fifteenth Meeting, June 22nd, 1857.—[*Final Meeting of the Session.*]

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Horace and Philip Smith, Esqrs., were presented upon their election.*

ELECTIONS.—*M. de la Roquette, Vice-President of the Geographical Society of Paris, as an Honorary Member, and M. Malte-Brun, Secretary of the Geographical Society of Paris, as a Corresponding Member. Commander E. Burstal,* R.N.; *Capt. H. Caldwell,* R.N.; *the Rev. H. J. Hose, Warden of St. Paul's College, Sydney; the Right Hon. H. Labouchere,* M.P.; *and Messrs. J. W. Brett; G. M. M. Esmeade; William Evans,* M.P.; *F. P. B. Martin; T. A. Noddall,* R.N.; *and A. D. White, were elected Fellows.*

DONATIONS.—The following were among the donations received since the former meeting:—'Index to the Ordnance Survey of Lancashire;' 'Blackie's Imperial Atlas of Modern Geography;' 'Ob- rvations made at the Magnetical and Meteorological Observatory at Toronto,' 4to.; Transactions of the German Oriental Society; the Darmstadt Geological Society; the Academy of Sciences of Paris; and the Statistical Society of London.

EXHIBITIONS.—Three very beautiful sketches of Eastern and Western Siberia, by Mr. T. W. Atkinson, made during his Seven Years' Journey in those regions, were exhibited at the meeting.

ANNOUNCEMENT.—The President announced that through the activity and zeal of their Corresponding member at Copenhagen, Captain Irminger, of the Royal Danish Navy, the services of the well-known Esquimaux interpreter, Carl Petersen, had been secured for the Arctic Expedition under the command of Captain M'Clintock, R.N., which would sail immediately on the arrival of the interpreter at Aberdeen.

The Papers read were:—

1. *Description of Vancouver Island.* By Lt.-Col. W. C. GRANT, F.R.G.S.

The position of Vancouver Island is between 48° 20′ and 51° N. lat., and between 123° and 128° 20′ W. long. It is situated on the western coast of North America, within a short distance of the mainland, the Straits of Fuca, which separate the island from the mainland on the south, forming the boundary in those parts between the British territories and those of the United States. The extreme length of Vancouver Island from north to south is 270 miles, with a general breadth of from 40 to 50 miles. The general aspect of the island is that of a broken rocky country densely covered with timber. The proportion which the available land bears to that which is totally incapable of cultivation is extremely small. The whole centre of the island as far as it has yet been explored consists of a barren rocky waste, the timber with which it is covered being, as well from its nature as from its position, unavailable for any useful purpose. Along the sea-coast a few patches of level land are to be met with, where the timber is extremely fine, and suitable either for masts and spars or for being sawn into planks. Small spots of open land, clear of trees, occasionally intervene, but seldom of more than a few hundred acres in extent; on these spots the soil is almost invariably extremely rich, and will produce abundantly every description of crop grown in Great Britain. The climate is agreeable and healthy, the summer is warm and dry; no rain falls from March till November; the remainder of the year is rather a rainy season than a severe winter; some snow falls, but does not generally lie long on the ground; and the frosts are neither hard nor of long duration.

The deposits of coal on the island are extremely rich, and are in many places favourably situated for export. The seas by which the island is surrounded teem with fish of almost every description. The salmon and herring are particularly numerous, cod and sturgeon also abound, and several whales are annually caught by the natives at a short distance from the coast. The prevailing geologial structures in the higher parts of the island are the gneiss and mica schist systems; in the lower, greywacke and clay-slate prevail. These are intersected by several dykes of igneous rock; and on the sea-coast basins of sandstone and of limestone occasionally occur. The native population of the island is calculated at from 15,000 to 20,000 souls; who are divided into numerous tribes, many of whom speak languages entirely different from each other. They are in general a harmless race, they live almost entirely by fishing, they are willing to work for the white man, but their labour cannot be depended on continuously. The island is still in its infancy as a colony; it possesses numerous safe and commodious harbours, is favourably situated for export to Oregon, California, the Sandwich Islands, Central and South America, Australia and China; and though now but little known, Vancouver Island cannot fail eventually to be of very considerable importance. The object of this paper is to make its position, its products, its natural resources, and its history, better known to the British public.

In answer to questions as to the climate, the adaptability of the island for colonisation, its mineral productions, &c., COLONEL GRANT said the climate was delicious for travellers, as from April to September there was no wet. This absence of humidity, however, was somewhat unfavourable for agriculture. With respect to colonisation, he thought Vancouver Island fitted for it, to a certain extent. The available arable land was small in proportion to that which was useless, so that it could never support a large population. The wheat and vegetables grown were very fine indeed. The island had not been surveyed, except a small portion by the Hudson Bay Company, and of that part about two-thirds were fit for agricultural purposes; the remaining third was useless rock. The quantity of coal discovered at present was small, but it was fitted for steam purposes.

SIR HARRY VERNEY, F.R.G.S., asked Colonel Grant whether the natives in the different parts of the island could communicate with each other, whether their languages were similar; and also whether there was any trace of any patriarchal government that had at any former period ruled over the whole of the island; also whether there was any trace of religion among the natives, whether it was a common religion, and whether there were any missionaries there?

COLONEL GRANT said that he had never been able to trace any real religion among them. They had some traditions excessively childish in their nature, and which did not point to one common object. They were scarcely aware of the existence of a supreme Being, though some had a glimmering notion of such a Being. One missionary informed him that they worshipped the sun, but he thought this too noble a superstition to exist in the breast of such a grovelling race of Indians as they were. They had a few superstitions among them. There were among them several most zealous Roman Catholic missionaries, who were incessant in their endeavours to implant Christianity. The savage was very ready to take any impression, but his mind was incapable of retaining any fixed idea, and the missionaries had consequently been unable to make any permanent progress. There were three languages in the island; the prevailing one was the Cowitcheu. The languages again were subdivided into various dialects, so that the different tribes speaking them could, with some difficulty, understand each other. There was not the slightest trace of a common patriarchal government. Each tribe had a patriarchal government, because each tribe formed a family something like our clans in Scotland.

Mr. Kenneth Sutherland, f.r.g.s., remarked that our Government had sent an expedition to Nootka Sound towards the end of the last century.

Colonel Grant said the object of Vancouver's expedition was to discover the North-West Passage, and in trying to discover it he saw a large inlet, which he immediately proceeded into, thinking it would conduct him to the opposite coast of America, and that he had found the long sought North-West Passage. He followed the channel and learned that he was sailing round an island, and he was much disappointed in finding himself in the Pacific again. In going round the island he met two Spanish vessels coming from Nootka, and they first told him that he was sailing round an island. He then went round to Nootka and gave the Spaniards notice to quit.

Mr. Monckton Milnes, f.r.g.s., asked whether Colonel Grant had ever turned his attention to the practicability of rendering the island a convict settlement?

Colonel Grant was afraid that it would not make a good convict settlement, on account of its contiguity to America. Access to the continent across the channel was easy, and to prevent the convicts escaping, a large military guard would be required.

The Rev. Brymer Belcher, f.r.g.s., believed what had been said about the missionaries in Vancouver Island was quite correct. At present there were no missionaries in the island, except some Roman Catholics, who had been engaged there several years. The Hudson Bay Company had a chapel at Victoria, and about a year ago an unordained labourer, a catechist, was sent out by one of the great missionary societies of this country to the southern part of the island. The gentlemen who brought their geographical knowledge to bear upon the missionary work of the Church, had looked on Vancouver Island as an unoccupied field, and had directed the attention of the Society for the Propagation of the Gospel to it. A grant of 250*l*. had been expended in sending out two missionaries. The population amounted to between 20,000 and 30,000 of native inhabitants, according to the last census given by the Hudson Bay Company. With respect to the climate and nature of the country, all the information that the Society had been able to obtain, went to show that there was nothing in either respect which the Anglo-Saxon race might not most easily overcome. The coal, to which allusion has been made, he had reason to believe, was spread over a large field, and was of very excellent quality, well suited for furnaces and for steam purposes. With coal and wood, and with what, there was every reason to believe, would be found in mineral products as well, Vancouver Island appeared to him to be one of the most promising fields open to the English settler.

Mr. R. Blanchard, f.r.g.s., late Governor of Vancouver Island, begged leave to offer an observation with regard to the population. Colonel Grant estimated it at 17,000, and Mr. Belcher at between 20,000 and 30,000. When he was there he took great pains to make inquiries of the people who, he considered, were best qualified to judge, and they stated the numbers to be, at the outside, 10,000, and that the population was decreasing.

The PRESIDENT, in closing the discussion, said it was evident that the island was destined to become a valuable possession of the British crown. The position it occupied, and the mineral riches it contained, with the probability of finding more, all tended to indicate its future value to our country.

The second Paper read was—

2. *Continuation of the Report of the North Australian Expedition.*[*]

Communicated by the Right Hon. H. LABOUCHERE, F.R.G.S., H. M. Secretary of State for the Colonies.

Sydney, 7th January, 1857.

SIR—I have the honour to transmit, for the information of his Excellency the Governor-General, an outline of the proceedings of the North Australian Expedition, from the period of leaving the Victoria, on the 21st June, to the 16th December, 1856, when the expedition reached Brisbane.

2. The exploration of the interior, beyond the sources of the Victoria River, having been carried to the full extent that the resources of the expedition would admit, I made preparations for carrying out that part of the instructions relating to the exploration of the country between the Victoria and Albert Rivers.

3. In making these arrangements it was desirable to provide against any contingencies which might prevent the land party obtaining supplies from the Tom Tough at the Albert River, which I had appointed as a rendezvous for the expedition; and it thus became necessary to reduce the land party to such a number that the horses now remaining could convey a sufficient supply of provisions for the whole journey to the out-stations in New South Wales, should we be compelled to do so, without further assistance.

4. I therefore organized a party of seven persons, consisting of myself, Mr. H. Gregory, Mr. Elsey, Dr. Mueller, C. Dean, R. Bowman, and J. Melville.

5. For the transport of this party and its equipment, only thirty-four horses remained out of the fifty originally embarked at Moreton Bay. Of these, seven were appropriated as saddle horses, and the remaining twenty-seven for the conveyance of the stores, &c., which comprised 1060 lbs. flour; 872 lbs. pork; 350 lbs. sugar; 380 lbs. meat; — biscuit; 100 lbs. rice; 30 lbs. sago; 32 lbs. tea; 30 lbs. coffee; 2000 rounds of ammunition; instruments; clothing; spare harness, &c.,—the whole weighing about 2 tons, exclusive of packages.

6. Having instructed Mr. Baines to embark the remainder of the exploring party and stores in the Tom Tough, and proceed to

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[*] *See* former Nos. of the Proceedings of the Royal Geographical Society.

Coepang for supplies of fresh provisions, and thence to the Albert River, to co-operate with the land party, I left the camp on the Victoria River on the 21st June, 1856.

7. Proceeding up the Victoria to the eastern bend in latitude 15° 38′, left the river on the 26th June, and followed up a large creek, coming from the eastward. The country at first was very rocky and of indifferent quality, except on the immediate bank of the creek, till we approached its source, when the sandstones were replaced by basaltic rocks, and the country changed to fine open grassy ridges, very thinly wooded.

8. Beyond this creek (latitude 15° 33′, longitude 131° 40′) a low sandstone table land commenced, elevated about 700 feet above the sea. The country now changed to thinly-grassed stringy-bark forest, destitute of watercourses, except a small creek which we struck in latitude 15° 30′, longitude 132°. As no water appeared to exist except in this creek, I followed it down to the N.E. to latitude 14° 54′, longitude 132° 30′, where it turned to the N.W.; but after five days' reconnoitering, succeeded in finding a passage to the E. across the table land (which appeared to be the northern extension of the interior desert) to a small creek, tributary to the "Roper" River, and moved the party to it on the 12th July.

9. Attempting a S.E. course, we were repulsed by a scarcity of water, and had to trace down the creek to its junction with the Roper, in latitude 14° 58′, longitude 133° 20′. The country improved, and was well suited for pastoral purposes, the rocks being basaltic.

10. Having followed the Roper 20 miles to the N.W., I again returned to a S.E. course, re-entering a poor sandstone country; and on the 18th July encamped on a small creek with a few waterholes.

11. In the afternoon a small party of blacks were observed watching the camp, and, on finding they were discovered by us, came up, but would not speak a single word, and soon after retired, but were detected stealing into the camp at night, when a discharge of small shot compelled them to retire.

12. The following day continued a S.E. route, encamping at a spring in a sandstone ravine, where the grass was very inferior, and we experienced some difficulty in keeping the horses near the camp, their instinct doubtless leading them to avoid a spot where poisonous plants existed, as the next day at noon two horses were taken ill, and died in less than an hour after; the stomachs, on examination, showing the action of violent poison.

13. We continued to traverse a very indifferent country, with flat-topped sandstone ridges, between scrubby valleys, in which small

creeks took their rise, and trending to the N.E., form the heads of the "Wickham" and "Liminin Bight" Rivers.

14. Scarcity of water, however, compelled us to turn to the northward, and travel along the broken sandstone country at the edge of the table land, reaching the "MacArthur" River on the 4th August, in latitude 16° 25′, where the channel did not exceed 20 yards in width; and so little water remained, even at this season, that it had to be followed down for some miles before a sufficient supply could be obtained.

15. Being desirous of keeping as far inland as possible, I again struck S.E., crossing the spurs of the table land. In the valleys between, many small creeks took their rise, and form the heads of the rivers which flow into the Gulf of Carpentaria.

16. The principal feature of the country was sandstone, though basalt and limestone frequently cropped out, and formed small tracts of grassy country, which seemed to expand to the north of our route; but to the south, the sandy table was almost unbroken.

17. The elevation of this table land gradually increased to about 900 feet above the sea, and in latitude 17° 40′, longitude 137° 40′, a spur, or rather a detached mass of greater altitude (1300 feet) projected from it to the north. From its higher ridges the view extended for 40 or 50 miles to the south; all was hopelessly level, and without a single marked feature.

18. 20th August.—Deep gullies took their rise on the S.E. slope of this high land, rapidly increasing, by their junction, into a considerable creek, which proved to be the head of the Nicholson River. Considerable difficulty was, however, experienced in descending into its valley, owing to the abruptness of the ridges, which were formed by the edges of sandstone strata at a high angle, while granite prevailed in the lower ground.

19. The Nicholson, however, soon re-entered the sandstone ranges to the E., over which we toiled for three days, without finding sufficient grass for our horses. Following down the river, the country became more level; narrow grass flats appeared on the banks, but the back country was still worthless, covered with very open scrub or terminalia and melaleuca, to within 30 miles of the Albert River, when grassy plains commenced, and extended several miles back from the right bank of the river.

20. On the 30th August crossed a fine running creek, which joined the Nicholson from the south, in latitude 17° 53′, after which the river turned to the N. Continuing our route E.N.E. for three miles, struck a fine brook of running water, with open grassy plains on its banks; its course was nearly east for four miles, when it was joined

by a small creek from the S., forming a fine reach of water, which we recognized as the Albert River of Captain Stokes, and Beam Brook of Dr. Leichhardt.

21. As the junction of these two branches of the Albert had been appointed as the rendezvous of the two sections of the expedition, it was with some anxiety we approached the spot, though our journey from the Victoria had been so rapid that I could scarcely hope to find Mr. Baines had arrived before us. Our hopes were raised almost to certainty, when in the distance a tree, with an inscription recently cut in the bark, was seen in the exact place appointed, but a closer inspection showed that it was not the work of any individual belonging to the expedition.

22. The following was the inscription, which, cut in large characters, extended round the tree:—

CHUMMLUT +
↑ ORE
RCH TO
1856.

23. The remains of a large fire, the names of some of the boat's crew, and the word "Torch," were cut and scratched on the small trees and stumps around, but nothing to guide us in the search for any papers which would throw light on the subject of the visit.

24. Having marked a tree with the date, initials of the expedition, and instructions for finding a tin canister containing memoranda, which was buried near the tree, I moved the party down to the right bank of the river, half a mile lower down, with the intention of proceeding downwards to the entrance of the Albert; but finding the water salt, I marked a second tree, and buried a tin with a memorandum of the proceedings of the expedition, prospective movements, and instructions for the guidance of Mr. Baines, should he arrive after our departure, as it was not prudent, under existing circumstances, to await the arrival of the vessel.

25. On the 3rd September left the Albert River, and traversed a level open country, thinly clothed with indifferent grass, the soil a brown clay loam. Two days' journey S.E. brought us to a river 100 yards wide, in detached pools. (Latitude 18° 12′, longitude 139° 55′.) This river was mistaken for the Albert by Dr. Leichhardt, and I therefore named it after that enterprising explorer.

26. Soon after we encamped a small party of natives approached, and assumed a somewhat threatening tone, but shortly after retired. On the following morning about twenty came up to us, well armed, and, while we were crossing a deep ravine, made a rush forward to

attack us, but when in the act of throwing their spears were checked by a discharge of small shot, and were quickly dispersed with the loss of their leader.

27. From the Leichhardt our course was nearly E., the country consisting of low sandstone ridges, very thinly timbered, and nearly destitute of grass. A few inconsiderable watercourses trended to the N., in which direction extensive grassy plains appeared to exist. Water was very scarce.

28. The country improved again as the Flinders River was approached, and where we crossed it, in latitude 18° 8', longitude 140° 50', the grassy plains extended nearly 20 miles back from the river on both banks.

29. Beyond this again we encountered a worthless country, perfectly level, covered with small trees and melaleuca scrubs. The scarcity of water repulsed us several times in the attempt to pursue an easterly course, and forced the party N. on the meridian of 141° 30', to latitude 17° 15', when we reached a broad sandy river bed, which is probably the Gilbert of Leichhardt.

30. The approach of the rainy season, which would prevent us from drying the flesh of our horses, should we require to replenish our stock of provisions, and the general health of the party rendering it desirable that fresh meat for a time be substituted for the salt pork, which had suffered much from the heat of the climate, both in quantity and quality, on the 18th we killed one of the horses, which had become otherwise unserviceable. The meat was cut into thin slices, and dried in the sun. The process occupied two days; the meat was tough, but by long stewing became very palatable, and scarcely distinguishable from beef.

31. The general course of the Gilbert was from the S.E., and this enabled us to resume our course, as a sufficient supply of water existed in its channel, though several miles often intervened between the pools. The country along this river was extremely level: only one ridge of hills was seen till we reached latitude 18° 20', longitude 143° (27th September), though the bed of the river rose to about 700 feet above the sea level. Grassy flats extended along its banks, from one to two miles wide; beyond which the country was very poor, with patches of melaleuca scrub.

32. Low ranges of hills now rose abruptly from the plain,—the prevailing rocks, slate, porphyry, gneiss, and granite. A decided improvement was also observed in the vegetation.

33. On the 5th October reached the head waters of the eastern branch of the Gilbert, and as it was necessary to reconnoitre the country before moving the party across the ranges, I proceeded

onward with Mr. H. Gregory for that purpose, and had a horse killed and dried during my absence from the camp.

34. On the 11th the party moved across the ranges, which rose about 2,500 feet above the sea level, in latitude 18° 45′, longitude 143° 50′, and encamped on a large sandy creek, tributary to the Lynd River, the southern branches of which we crossed the following day. The lower part of the valley of the Lynd was here about 1,500 feet above the level of the sea, the primary ranges rising abruptly to the W., but the eastern side was formed by a gradually rising sheet of basaltic lava, which separated it from the valley of the Burdekin. This portion of the country was well grassed, but from the porous nature of the rock, destitute of surface water.

35. On the 14th descended into the valley of the Burdekin, and on the 16th reached that river in latitude 18° 57′, longitude 144° 50′. The channel was about 50 yards wide, with a small running stream of water winding along the sandy bed. The country was of a very broken and almost mountainous character, the valley and some of the lower ridges well grassed and suited for stock, the higher ranges usually poor and stony.

36. Except in the river itself, surface water was very scarce at this season, and our route consequently along its right bank; the general course S.E.

37. Below the junction of the "Clark," the country improved considerably, large tracts of basaltic rock forming very ferfile land by its decomposition.

38. South of latitude 20° granite and trap prevailed, forming fine open grassy ridges, timbered with iron bark; and this continued to latitude 26° 40′.

39. Reaching the junction of the Burdekin with the "Suttor" River, on the 30th October, in latitude 20° 36′, longitude 146° 50′, I followed up the latter river, soon encountering dense brigalow scrubs, which gradually extended over the whole face of the country, and impeded our progress considerably.

40. In about latitude 21° 30′, longitude 146° 40′, the Suttor is joined by the "Belyando" of Sir T. Mitchell. This river was running, there having been heavy rains on the upper part of its course.

41. Availing myself of this favourable circumstance, I followed it up to latitude 22°, and then steered S.E. in hopes of finding a more open country, but after crossing a low ridge of sandstone hills, entered a vast level plain, covered with brigalow scrub, which continued to latitude 22° 40′, longitude 147° 10′, where we crossed a range of scrubby mountains, and descended to "Peak Downs" on the 12th November.

42. Peak Downs, as seen from the western range, extended N.W. and S.E. for about 60 miles, with a breadth exceeding 30 miles, consisting of gently undulating plains of rich black soil, well grassed. These plains are separated by belts of thick scrub; the prevailing rock, basalt and limestone. The absence of the surface water will, however, prove a serious drawback to this otherwise fine tract of country.

43. This scarcity of water obliged the party to skirt the S.W. limit of the open country, and much brigalow scrub was encountered.

44. On the 15th November reached the left bank of the "Mackenzie" River, about 15 miles above its junction with "Comet" River.

45. Being nearly on the latitude of Port Curtis, I steered an easterly course through a succession of dense scrubs, and on the 22nd November reached Messrs. Fitz and Connor's station on the Dawson River, where we experienced a most hospitable reception.

46. It now only remained for me to connect the route of the expedition with some known point on the surveys of the district, and I proceeded to Mr. Hay's station, near which the Crown lands commissioner of the district was encamped; but as the duties of this department have little reference to the geographical features of the country, the position of the stations could not be ascertained. Mr. Wiseman, however, afforded me all the information in his power, and I consequently proceeded fifty miles by the road to Gladstone to obtain bearings to Mount Larcom and other hills near Port Curtis. The party travelled by the road through the Burnett District, and reached Brisbane on the 16th December, 1856.

47. Extreme monotony characterises the physical features of the whole country travelled by the Expedition from the Victoria to the 140th meridian, the interior appearing to consist of a table land of sandstone formation, averaging 800 feet above the sea level, along the edge of which small rivers take their rise, and traverse the short space which intervenes between the table land and the ocean.

48. This table land appears to form the continuation of the interior desert which exists to the south of the Victoria, the geological structure being the same, though from its greater proximity to the coast, on the line traversed, causing a less arid climate, the soil supports a greater amount of vegetation, and, consequently, it did not exhibit those remarkable ridges of drifting sand which characterise the more inland portions.

49. It was this inhospitable region, destitute of the requisites for the support of the party, which compelled the expedition to deviate so much towards the coast, and by following the northern slope take

advantage of the watercourses which there take their rise, and originate the numerous small rivers crossed by Dr. Leichhardt in his journey along the coast of the Gulf of Carpentaria.

50. I was desirous, had the nature of the country justified the attempt, of taking a more inland course than that traversed; but the absence of tributaries on the easterly side of the upper valley of the Victoria had warned me that the country in that direction was impracticable at the period of the year, as the wet season had terminated before the return from the exploration of the interior.

51. The route of the expedition was perhaps that which will tend more to develop the physical character of the northern portion of the continent, as the distance to which the rivers extend from the coast has now been approximately ascertained, and as none of the watercourses could extend any considerable distance into the interior beyond the line traversed by the party.

52. The insignificant size of the watercourses crossed between the Victoria and Albert Rivers is almost a proof that no country available for the purposes of settlement, exists to the south of the line traversed, while the small quantity of available land seen to the north, and the unfavourable account given by Leichhardt of the parallel line on which he travelled near the coast, render it improbable that any considerable tract of land suitable for settlement exists on the S.W. shore of the Gulf of Carpentaria.

53. On the western shores of the Gulf, the extensive development of basaltic rocks results in the formation of a fine tract of pastoral country, in which the upper river takes its rise.

54. The "Plains of Promise," which occupy the south shore of the Gulf between the meridians of 139° and 141°, extend little beyond latitude 18° 10′, south of which we always met with miserable sandstone ridges, except on the banks of the Flinders and Leichhardt Rivers, and the whole of these plains seem to result from the gradual recession of the waters of the Gulf. The grass was generally inferior, both in quantity and quality, to that on the Victoria or the eastern coast. Water is scarce during the dry season, and the surface is so level that it is excessively wet and boggy during the rains.

55. Had the vessel reached the Albert in time to co-operate with the land party, my intention was to have explored the courses of the Leichhardt and Flinders Rivers, which are now the only rivers in Northern Australia, the sources of which have not been ascertained, though from their size there is reason to think that they do not extend more than 100, or at the most 150 miles from their mouths.

56. East of the Gulf, after receding 30 miles from its shores, the

level country is covered with worthless scrubs of melaleuca, and triodia covers the more open country. Even along the course of the Gilbert, the extent of available country is by no means great.

57. Crossing from the western to the eastern waters, a marked change was observed, after travelling over nearly 13° of longitude in a country where the same geological and physical characters were almost constant. The sandstones were completely superseded by slates and primary rocks, climate and vegetation seemed to change in the space of a few miles, and it was only where wide spread plains of basaltic lava, with their peculiar vegetation, occurred, that any semblance of the western country remained.

58. Although large tracts of inferior country exist on the upper portion of the Burdekin, yet there are many fine patches of country well adapted for stock, while the never-failing supply of water in its channel, the hilly and varying character of the district, by protecting it from the serious consequences which attend long droughts in more level portions of Australia, will render it eventually one of the important districts of the colony.

59. South of the Burdekin we encountered the first brigalow scrub, which formed a broad belt, widening as it receded from the coast, and it separates the fine country just referred to, from the valleys of the Mackenzie, and other tributaries of the FitzRoy River.

60. So large an extent of this latter district has already been tendered for as stock runs, and reported upon by the Commissioner of Crown Lands, that it would be useless for me to attempt a further description, which would necessarily be imperfect.

61. With reference to the capabilities for settlement, the portion of Australia traversed by the expedition may be divided into three sections, each with its distinct character, climate, and geographical position, viz., the N.W. Coast, the Gulf of Carpentaria, and the Eastern Coast.

62. The first of these offers considerable facilities, the Victoria giving access to the interior; the navigation is by no means difficult, if due precaution be observed. That the country is suited for stock, is shown by the excellent condition of our horses and sheep, which recovered rapidly from a state of extreme exhaustion, consequent on the protracted sea voyage, while there is reason to believe that large tracts of good country extend as far to the S.W. as the FitzRoy, beyond which the desert appears to come down to the coast.

63. Considering its position within the tropic, it is well watered by the rivers; and though the climate is extremely hot during three

months of the year, the dryness of the atmosphere seems to counteract that unhealthiness which is usually inseparable from these latitudes.

64. The country around the Gulf does not offer any great inducement to the settler, being devoid of good harbours; the rivers are only accessible for small vessels, while the available country bears but small proportion to that which is utterly worthless. Its relative position causes its climate to participate in some degree with that of the Australian interior, and appears to be subject to drought.

65. On the eastern coast a large proportion of good country exists along the course of the Burdekin River and its tributaries. It forms a continuation of the tract which extends north from Moreton Bay, over which the stations are extending with such rapidity, that a few years will probably suffice for the settlement of the country to latitude 18°.

66. Judging from the character of the vegetation, the climate of this part of Australia is cooler and more humid than that of the Gulf or N.W. Coast; the rainy season is not confined to any particular period of the year, being situated between the intertropical and extratropical climates, the wet season of the former occurring from November to March, and the latter from May to September.

67. With reference to the aborigines of Northern Australia, I have been able to collect little information. Except in the immediate vicinity of the sea coast at the mouth of the Victoria, and on the southern shores of the Gulf of Carpentaria, their numbers are apparently small, though the recent traces in every part of the country visited, showed them to be diffused over the whole, and small parties were often seen.

68. Except on the few occasions detailed in the journal, our interviews were of a friendly nature, though twenty-six years' constant intercourse with the aboriginal Australians has convinced me how little their professions are to be relied on; and I therefore never relaxed those precautionary measures which, though they somewhat interfered with the collection of information regarding their habits and customs, has, with one exception, enabled us to avoid collision in which life had been unavoidably sacrificed.

69. In no part did I observe any marked difference in race or form of weapons from the aborigines of the western coast, except such variations in the latter as were requisite from the difference of the materials from which they were constructed. The language differed from either that of Moreton Bay or Western Australia. Circumcision, and the removal of the front teeth, are practised by some of the tribes, but others did not practise either rite.

70. Circumstances over which I had no control compelled me to impose many duties on the scientific officers of the expedition, which, of course, greatly circumscribed their opportunities for collecting specimens and notes relative to the departments specially in charge. A large collection had, however, been made before I left the Victoria, to which the unabated zeal of Mr. Elsey and Dr. Mueller has enabled them to make many valuable additions during the last journey; and it gives me pleasure to record my thanks to those gentlemen, and also to Mr. H. Gregory (to whose unwearied care and judgment in conducting the transport service of the expedition, the extraordinary rapidity and success of the several journeys are mainly attributable), for the cheerful assistance and support they afforded me in carrying out the objects of the expedition. To Mr. Baines I am also particularly indebted, and can only regret that I have been compelled to detain him on service which, while it almost precludes his devoting his time to his artistic pursuits, imposes duties of a peculiarly harassing nature.

71. I would also bring under his Excellency's favourable notice the excellent conduct of Charles Dean, Robert Bowman, and John Melville, who accompanied me from the Victoria to Moreton Bay, and whose constant attention to their several duties, and cheerfulness under privations of no ordinary nature, merit the highest commendation.

72. I am now preparing a map of the route of the expedition from the Victoria River towards Moreton Bay, and will transmit the same on its completion.

73. All the documents relative to the expedition, previous to the 21st June last, are now on board the Messenger, which vessel was employed on the service of the expedition after the Tom Tough became unfit for further service; and I daily expect her arrival in Sydney, with the remainder of the party in charge of Mr. Baines.

I have the honour to be, Sir,

Your obedient servant,

A. C. GREGORY,

Commanding N. A. Expedition.

The Honourable the Colonial Secretary,
&c., &c., &c., Sydney.

MR. J. R. ELSEY, F.R.G.S., surgeon to the North Australian expedition, made a few remarks on some of the physical features of the country traversed by the expedition. He brought forward a short report which he had furnished to Mr. Gregory, of the climate of the country, and its sanitary effect upon the party. He hoped before the next meeting of the Society to have corrected and completed a meteorological journal kept by him at the Victoria River, during nine months, which was at present, with other more detailed notes, on board the Messenger.

The President asked whether it was discovered that the Newcastle range divided the waters that fell into the Gulf of Carpentaria from those that flowed into the ocean?

Mr. Elsey replied that the Newcastle range did not divide them. It was a peculiar feature of the range that the Gilbert river ran through it.

The President said the Meeting would agree with him that the exploration of Mr. Gregory and his associates had been one of the most remarkable ever undertaken by the explorers of Australia. The Society had already honoured the chief of the expedition with their Gold Medal; and he was sure, from what had fallen from Mr. Elsey, that a whole evening might still be profitably devoted to the consideration of the subject.

The third Paper read was—

3. *On the Structure of North-Western Australia.* By Wm. H. Fitton, Esq., M.D., F.R.G.S., &c.

Addressed to Sir Roderick I. Murchison.

Having undertaken so long ago as in 1825 to examine and describe some specimens brought from the coast of Australia by Captain Philip Parker King, R.N., I ascertained the disposition of the strata on the part of the north-western coast which that officer has described; and finding in Captain Flinders, an account of the chains of islands, where he closed one division of his survey, I was led to connect his observations at the N.W. of the Gulf of Carpentaria with what I had learned from Captain King—the distance between the two stations and the extreme points of this region being not less than 18° of longitude,—about 1250 English miles.

The following is an extract from Captain Flinders's description of a part of the N.W. coast:*—

> "A third chain of islands commences here, which, like Bromby's and the English Company's Islands, extends out north-eastward from the coast. I have frequently observed a great similarity, both in the ground plans and elevations of hills and of islands, in the vicinity of each other; but do not recollect another instance of such a likeness in the arrangements of clusters of islands. This third chain is doubtless what is marked in the Dutch chart as one long island, and in some charts is called 'Wessel's Eylandt,' which name I retain, with a slight modification, calling them *Wessel's Islands*. They had been seen from the N. end of Cotton's Island to reach as far as thirty miles out from the main coast; but this is not more than half their extent, if the Dutch chart be at all correct."

These observations from a geographer of such talents and experience as Captain Flinders, coinciding with what I had learned from the maps and specimens of Captain King, led me to the speculations given in the paper, which form a part of the Appendix to the voyage of Captain King,* and which have been confirmed by more recent observation; so that it is now ascertained as matter of fact that the whole of the N.W. coast, from the Gulf of Carpentaria to the scene of Captain King's observations, and those of the French voyages on the W.,—may be regarded as one great deposit of ancient sandstone, extending to more than 14° of longitude (about 973 English miles), and forming, apparently, a great natural division of the country.

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* Flinders's 'Voyage to Terra Australis (vol. ii. p. 24), prosecuted in the years 1801 *to* 1803'—*with an* Atlas. London. Two vols. 4to. Not published till 1814.

This view, which is given as a speculation in the Appendix to Captain King's work, published in 1825, has been confirmed by the more recent observations of Leichhardt,† and especially by the valuable discoveries of Captain Stokes in the years 1837 to 1840.‡ It is further confirmed by the observations obtained during a recent expedition of Mr. Gregory, of which an account has been published in the Geographical Journal, and a sketch given in Arrowsmith's map of 1856;—and by the tracings of Mr. Wilson, the geologist connected with that expedition, which represent several remarkable ranges of sandstone, named Stokes, Newcastle, Ellesmere, and Murchison Ranges; all of them according in direction and composition with what was to have been expected.

A copy of Arrowsmith's map, which I now send, with lines rudely marked upon it, will sufficiently explain these views; representing first, the remarkable ranges on the N.W. coast, described by Captain Flinders; secondly, the course of Leichhardt's journey, which exhibits two portions—first, a line parallel to the coast at the bottom of the Gulf of Carpentaria, and, secondly, a continuation, nearly in the same direction, of streams connecting that gulf with Van Diemen Gulf, and passing through a remarkable group of mountains, which form what is called in the map a high table-land, 3000 or 4000 feet high; thirdly, a portion of Victoria River, discovered by Captain Stokes; and fourthly, the remarkable group of islands, extending from Dampier Land to Cape Londonderry, and exhibiting numerous instances of the peculiar form resulting from the summit of trap-rocks, described by Captain Stokes and represented by Captain King,—with long straight fissures, of which Prince Regent River is a remarkable example.§

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[*] 'Narrative of a Survey of the Inter-tropical and Western Coasts of Australia.' Two vols. London: 1826. Appendix, vol. ii. pp. 556 and 600.

[†] 'Journal of an Overland Expedition in Australia from Moreton Bay to Port Essington,'—a distance of upwards of 300 miles. 1844 to 1845. London: 1847.

[‡] 'Discoveries in Australia, with an Account of the Coast and Rivers explored and surveyed during the Voyages of H.M.S. Beagle, in the years 1837 to 1842.' By John Lort Stokes, Capt. R.N. Two vols. London, 1846.

[§] See the Plate, given by Captain King, of a portion of strata, consisting of reddish sandstone, on Prince Regent River. Vol. ii. p. 40.

It may be remarked that the general outline of the island of Timor, at the distance of about 250 miles, is nearly parallel to the direction of the strata in this portion of Australia.* And, perhaps, it may not be carrying speculation too far to observe that the lines of direction of the strata, in several points in the northern hemisphere, nearly coincide with that above mentioned, the predominant ranges in North America and in England having a direction nearly from N.E. to S.W.

The points of resemblance of a large portion of the S.W. of this part of Australia to the old red sandstone (Devonian) of England, are obvious; and the analogy is increased by the trappean rocks, which, in many instances, are found, especially on the N.W. coast, capping, or alternating with, red sandrock; but no fossils have yet come to my hands.

The relations of the sandstone in the S. of Australia, and in Van Diemen Land, are now interesting subjects for inquiry.

The PRESIDENT pointed out the value of this memoir to geologists, and warmly commended the speculations of his old and eminent friend Dr. Fitton.

The fourth Paper read was—

4. *Notes relative to the late proposed Expedition to discover the Sources of the White Nile.* By MR. A. W. TWYFORD.

THIS expedition was organised in the autumn of last year, through the direction of the Pasha of Egypt, by M. le Comte d'Escayrac de Lauture, who, in accordance with the wishes of the Pasha, collected for the purpose twelve gentlemen from different European countries. Through the kind introduction I received from your Secretary, Dr. Shaw, to the Count d'Escayrac, I had the honour of receiving one of the appointments with a view of assisting in navigating the boats up the Nile.

As communications respecting the objects of the expedition have already been made to the Society by Count d'Escayrac, I feel it only necessary under the circumstances to explain what part I myself took in the expedition. As every one knows the route from Marseilles to Cairo, I will not dwell upon that part of my trip, but at once begin by stating that we arrived at Cairo on the 27th of September, 1856, and after consuming a good deal of time, through want of preparation before my arrival, I managed to start with the boats on the 19th of the following month; it having been arranged at Cairo, that with M. Pouchet the doctor, and Mr. Clague the photographer, I should proceed with my flotilla to Berber, up the river, there to be joined by M. d'Escayrac de Lauture and the rest of the party.

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* The line which includes the great volcanoes of Symbaua has a direction nearly from east to west, making a considerable angle with that of Australia, &c., a change not impossibly connected with volcanic action. I find in Mrs. Somerville's Physical Geography that the line of direction of Wessel and the other islands is continued in New Guinea, but the authority is not mentioned.

Under instructions from the Government I had collected at Cairo one steamer of 30 horse-power, one of 15, and four of the large-sized country boats heavily laden with waggons, which were considered necessary for the expedition, with four ordinary ship-boats.

I was furnished with a guard of sixty soldiers and sailors, and invested with the command of this—the nautical—part of the expedition.

Having left Cairo on the 19th of October, 1856, we were towed by two large steamers as far as the first cataract, where we arrived on the 31st of same month.

As so many country boats now pass over this cataract every year, the difficulty is greatly diminished as regards that sort of craft, but, as far as steamers are concerned, it is very different, for with the exception, I believe, of the two steamers that conveyed Mahomet Ali and his suite to Korosko, about the year 1820, the steamer under my charge is the only one that has been carried over.* The chief difficulties I encountered here arose from the dislike that the sailors had to pass over the cataracts in the steamers, and the terror with which the natives viewed the proceeding altogether.

Nothing short of my immediate presence in each boat, as it went over, would induce any of them to work at all. It took about a day to pass each boat over, having frequently upwards of 600 men all pulling or pretending to pull at once. It was entirely owing to my being there too late in the year that I failed in getting the large steamer over, for I am persuaded that it would be comparatively easy to pass any vessel, not drawing more than 10 feet of water, over the first cataract in the months of July and August. For this reason we left the largest steamer behind, as when once the Nile has commenced falling it does so with amazing rapidity.

The first cataract is nothing more than a very narrow and shallow succession of channels, through which the water pours with great rapidity at the rate of 6 or 8 miles an hour. About 3 miles from

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* With reference to a paragraph that appeared in 'The Papers' that I had lost one of the steamers under my charge in ascending the first cataract, I beg to state that this assertion was incorrect. The facts of the case were these:—Finding I was not able to get my second (the largest of the two) steamer up the cataract, I left it at Assouan; but a steamer belonging to the Pasha, that was at Assouan at the same time, was lost in an attempt to ascend the cataract, which probably led to the above mistake.

Assouan I came to the first ridge of rocks, which stretches, with the exception of a very narrow channel, right across the river. The water pours through this channel at great speed, but the engines were powerful, and we got through in safety. From Assouan up to this part of the cataract there were 10 to 20 feet of water. After getting over this, you go through quiet waters for about three-quarters of a mile or so, when you come to the second ridge, which is a repetition of the first, with the exception that the higher you go the greater is the difficulty, as the water then runs with greater rapidity and the channel becomes more shallow. The steamer passed through the second rapid; but on coming to the third, the engines were not able to hold their own, and began to go astern, on seeing which there was a universal yell set up by the rais or boatswain of the cataracts and his men—as they were told that if anything happened to the boats they would have their heads cut off by Said Pasha, the Viceroy. Overboard they all went, and in a few minutes we had about 800 men pulling away on the ropes, and after an immense struggle with the water, we passed over. Another ten minutes brought us to a corner round which the water ran more rapid than ever. Here we again went astern, although the engines were going at full power. Here the steamer struck on the rocks, and although the boat had no hole made in her, I was in momentary fear of losing the screw or the rudder. The Governor of Assouan and his numerous attendants got into a fright here, and began to count their beads. The women and children were driven out of the neighbouring hovels and made to catch hold of the ropes, and at last we succeeded in hauling the steamer off.

We next reached the fourth ridge, where the steamer struck violently on the rocks.* She was then on the west side of the channel, but we got her off again and tried her in the middle channel, and there she struck again, and continued bumping violently. I then saw that it was quite impossible to get her over the rapids, and after taking counsel with the Governor, I determined to take her back to Assouan, at which place we arrived in the evening.

The following day I went over the cataracts with the rais, and got capsized out of my boat; but I am of opinion that the large steamer might have been taken over if I had received proper assistance.

On the following day I determined to make another attempt with the steamer over the cataracts, but as the rais refused to lend me assistance I was obliged to give up the attempt.

On Wednesday, 12th of November, I got my last boat over the cataracts, and on Thursday the 13th started at daylight with all the boats before me. About 8 A.M. came to a village named "Kouloutout," where two of the rais or pilots had their country-houses of mud, and where at their request I stopped for ten minutes to allow them to get some food that their families had prepared for them. The whole population ran out to say "Good bye" to their relations, crying bitterly; for they all thought that we would never return.

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* This Channel, after December, is quite dry.

The wife of one of the pilots made her appearance with a sheep as a present to me. As long as the villagers could walk along the shore they kept the boats in company, wailing and screaming fearfully; and when the shore came to an abrupt termination, they all set to work throwing water at us for good luck.

The morning that the first of my boats tried to get over, the rais of the cataracts sacrificed a sheep to some saint's tomb or another, to persuade him to get the boats over safely; and when the steamer struck on the rocks, he swore by Mahomed that he would never waste another sheep. One of my cawasses also told my interpreter that as he had to go over the cataracts next day, he had sacrificed a sheep the night before.

On Sunday the 23rd we reached the village of Wadi Halfeh. As soon as possible I went up to the foot of the second cataract in the steamer, and we then took to a little cutter and went over the cataracts. These deserve the name of cataracts, though the first do not.

There are two channels, one easier than the other, both passable at high Nile; but I arrived too late for the easy and safe passage, and had to wait until the large passage became passable. The water rushes through with the greatest violence, and there is a 2 or 3 feet fall.

The cataracts are a succession of rapids, each one as you ascend being worse than the former.

I took the effendi and the sheik of the village with me in the cutter, who were both in a great fright. They had neither of them been over the cataracts, and never would have gone of their own free will. The cataracts do not present such a fine view to the eye as one would expect, but they are much more extensive and more dangerous than the cataracts at Assouan.

No one can conceive the rapidity with which the water pours down. For instance, it took me, in a small boat pulled by ropes and fifty men, eight hours to ascend, and one to come down; and in ascending one rapid, it was as much as I could do to sit still without going head over heels into the water, the boat's bow was so much above the stern.

Monday, 24th November.—From the date of my arrival at Wadi Halfeh till my departure, it blew a strong gale from the N.W. and was very cold.*

I was 16 days in passing the steamer and dahabiahs (boats) over these cataracts, during which time I kept 3500 men fully employed. Some of the men I took from Assouan and the villages as I came along, and the rest were sent all the way from Dongola.

The cataracts are 12 miles in length by 3, and are interspersed with rocks and islands,† some a mile in length, and the channels alter according to the time of year at which boats happen to arrive. In some places I found a fall of water of 3 or 4 feet, and in others the rapids had to be passed over a straight piece of water of 300 or 400 yards.

On the morning of the 15th of December, after great difficulty and contention with the natives, and much anxiety on my part, we got clear of the Wadi Halfeh or cataract, and on the following morning started early for Dongola. On our way we found four more cataracts: the names of these are Ambercole, Tangúr, Dal, and Hannek. After having with difficulty surmounted them, we proceeded up the river and arrived at Dongola on Sunday the 4th of January, 1857. Here I waited a fortnight to repair the boats.

On the morning of the 28th I started towards Meroe, or the fourth cataract; and on reaching the village of Ambercole received a letter from his Highness the Viceroy, informing me that the expedition was broken up, and ordering me to return, but to wait for him at the village of Abdúm, where he would join me in a few days from Khartum.

On Friday, 6th of February, the Pasha with his suite and troops arrived, and we all returned to Dongola. I was then informed of the particulars which led to the breaking up of the expedition, and received orders to return overland to Cairo, at which place I arrived, after a very fatiguing journey, on Sunday the 19th of April.

I cannot submit these few hurried notes without making a few concluding remarks. When I accepted my appointment from the Count d'Escayrac, I was not aware that I should have held the responsible situation I did. A French naval officer was to have had the command of the boats; but as he did not make his appearance in time, I was obliged to take his place. I was determined, however, not to shrink from the responsibility—the pride of being the only Englishman in the expedition, the confidence I had in my own determination to do my best, and the hope of distinguishing myself, bore me up. I very much regretted that boats especially adapted for the purpose had not been built in England. If this had been done, the great and almost insurmountable difficulties I sustained at Wadi Halfeh would have been in a great measure obviated; and had I left Cairo at the proper season I should have experienced much less trouble altogether. When I heard that this expedition was abandoned, it was a great source of satisfaction to me to know that my conduct had been appreciated by the Royal Geographical Society.

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* The meteorological and other observations I made, I will take another opportunity of communicating to the Royal Geographical Society.

† These islands are barren, though at high Nile they are mostly under water.

The PRESIDENT said, they must all feel proud of the prowess of their young countryman. He must remind them that M. d'Escayrac, the head of the expedition, was the author of a valuable work on the geography of Sudan, and he only regretted that the dissensions which had broken out in his camp, had prevented him from joining Mr. Twyford at the cataracts of the Upper Nile, and thus carrying the expedition towards its ultimate destination.

The fifth Paper read was—

5. *Report of the Expedition for the Exploration of the Rewa River and its Tributaries, Na tite Levié, Fiji Islands.* By Dr. MACDONALD, R.N.

Communicated by the ADMIRALTY.

[This Paper will be published in full in the next Journal.]

The sixth Paper read was—

6. *Report on the Specific Gravity of the Sea-Water on the West Coast of Africa.* By HENRY M. WITT, F.C.S.

Royal College of Chemistry, April 17, 1857.

SIR,—The samples of sea-water collected on the western coast of Africa by Dr. Campbell, and placed in my hands by you, were, I regret to say, far too small to admit of chemical analysis.

The colour which the sea had acquired by the influx of a large river you mentioned as being peculiar, and were desirous of information as to the nature and amount of the colouring matter: all that I have been enabled to ascertain on the subject is, that it was evidently a suspended yellow substance which modified the usual green colour of the sea; this suspended matter had separated from the water in the samples submitted to me, and appeared curiously light and flocculent, so that it would suggest for itself a more or less organic origin; but its amount was really small, in some of the samples only just visible: so that to have made a chemical examination of it in order to ascertain its real nature, or even to determine its relative proportion, would have required at least a gallon instead of one or two ounces of water.

In most cases, however, the samples were sufficient to enable me to determine the specific gravity, and these numbers may possess some little interest, as a further confirmation of the general observation of the diminution of the specific gravity of sea-water as it approaches the mouths of rivers.

The experiments were made after filtering off the suspended matter, so that all the samples were in the same clear state, and at the same temperature of 60° F.; and I may be allowed to mention that, although the differences may appear slight, they are, in fact, considerable, it being remembered that in every case about 1000 grains of water are used.

The samples were numbered as they approached the coast, commencing at the greatest distance from it, and their specific gravities are contained in the subjoined Table:—

Number of Sample.	Date when Collected.	Latitude.	Longitude.	Temp. of Water.	Temp. of Air.	Specific Gravity.
	1856.			Fahr.	Fahr.	
1	May 23 .	3° 17′ S.	2° 25′ E.	75° 0′	77°	1·027455
2	,, 24 .	3 17 S.	3 37 E.	75 0	77	1·027865
3	,, 25 .	3 26 S.	4 42 E.	74 5	76	1·027370
4	,, 26 .	3 27 S.	5 37 E.	75 0	76	1·027070
5	,, 27 .	3 45 S.	6 55 E.	77 0	77	(*)
6	,, 28 .	3 57 S.	8 25 E.	76 0	76	1·027000
7	,, 29 .	4 58 S.	8 27 E.	75 0	76	1·025200
8	..	..	..	75 0	74	(*)
9	No label.	..	..	..	..	(*)

(*) In these cases, there being less than 1000 grains, the specific gravity even could not be taken.

Hence it appears that the specific gravity of the open sea, unaffected by rivers, may be assumed to be about 1·02745 to 1·02785, unless at these furthest points it be still reduced by the same cause.

The following are some of the results of other observers:—MM. Adolphe and Hermann Schlagintweit[*] give 1·0277 as the mean specific gravity of the Atlantic, from the results of a series of experiments made on a voyage from Southampton to Bombay in 1854; and Rear-Admiral Philip King, R.N., F.R.S., gives a mean specific gravity for the—

Pacific, between 10° and 40° S. of 1·02648,
,, ,, 40° and 60° ,, 1·02613,[†]

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[*] Philosophical Transactions, January, 1855.

[†] Ibid., December, 1856.

so that it would appear probable that the Atlantic has a higher specific gravity than the Pacific, and it would be interesting to confirm this by further observations, or more correctly by actual determinations of the quantity of saline matter.

Of course the density of inland seas, as the Mediterranean, &c., is higher than that of the Atlantic or Pacific Oceans.

Although the fact of the diminution of the specific gravity of sea-water by the influx of large rivers is an observation which we should anticipate *à priori*, I find only two other recorded sets of experiments on the point. Mulder* states that the specific gravity of the Atlantic falls, in the North Sea, where several large rivers enter it, to 1·0255; and Dr. John Davy† found that at the mouth of the Demerara the density of the water was 1·0036, whilst that of the sea eighty miles distant was 1·0266; and my own experiments show a similar diminution, the sample taken nearest the Loando coast (viz. in long. 8° 27′ E.) having a specific gravity of 1·02520, whilst in the long. 3° 37′ E., or 4° 50′ further from the coast, the specific gravity of the sea-water rose to 1·02786.

I have, &c.,

HENRY M. WITT, F.C.S., *Assistant Chemist.*

To Sir Roderick Impey Murchison, PRESIDENT R.G.S., &c., &c.

The PRESIDENT next announced the titles of other papers which, for want of time, had not yet been read.

He had also to call their attention to a series of remarkable water-colour sketches of the mountains of porphyry, basalt, and other igneous rocks in the interior of Asia, extending into China—countries of which they had hitherto possessed little knowledge. The explorer of this region, Mr. Atkinson, was present, and was about to produce a beautifully illustrated work which would throw new light upon the structure of the interior of Asia.

The President then gave some information respecting the expedition which was about to proceed to the Arctic regions under Captain M'Clintock. Great importance was attached to the acquisition of an interpreter, and they knew that an Esquimaux interpreter was not easily obtained. The Secretary had long ago been in correspondence with Captain Irminger, of the Danish navy, to procure the services of that excellent man Petersen, who had lived among the Esquimaux in Greenland a long time, and who had already served as interpreter with Penny and Kane. That person had arrived from Greenland at Copenhagen a few days ago, and intelligence of the fact having been received on Saturday, he (the President) had immediately telegraphed to Captain Irminger, requesting him to send off Petersen at once. He was happy to say that an answer had been received, stating that Petersen would be in London on Wednesday, and proceed on Thursday to Aberdeen. The expedition would sail immediately on his arrival.

In concluding the business of the meeting, and at the same time closing the session of 1856-57, the President said he was sure his associates would admit that there never had been a session of the Geographical Society more productive of valuable results than the one which had just transpired. Lastly, he had the pleasure to announce that having applied to the University of London, and to the Royal Society, for permission to assemble in their great room at Burlington House during the ensuing season, the request had been willingly conceded. They would thus have a spacious place of meeting, where ladies as well as gentlemen might assemble, without being exposed to the inconvenience which had been felt in their present small apartments.

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* Poggendorf's Annalen, xxxix. 513.

† Edinburgh New Philosophical Journal, xliv. 43.

The PRESIDENT then formally declared the Session to be closed.

ADDITIONAL NOTICES.

1. *A short Account of a Journey across the Rivers of British Kafraria, thence from the Great Kei to the Gnabaka River, with a Description and Sketches of Fossil Remains near the mouth of the Gnabaka.* By the Rev. FRANCIS FLEMING, M.A., F.R.G.S.

I LEFT King William Town at 5 A.M. on Monday, Nov. 21, 1853, and having heard of some gigantic fossil remains lying somewhere near the mouth of the Gnabaka, I determined to visit them, and likewise see something of the country lying near that river and the Bashee. Having but six days' leave, I consequently felt that I had undertaken no easy week's work, as these rivers rise about 150 miles to the N.E. of King William Town, and in the centre of Kreli's Kafirs, among whom the rebel Hottentots had been dispersed. I put my full confidence, however, in the savage *honour* of the Kafirs, and determined to go nowhere without one, from whom I would first exact a promise to guide me safely. This I found to answer admirably, as during my trip I had on different occasions, and in different localities, six Kafir guides, who all fulfilled strictly their engagements with me, conducted me safely, prevented interruptions and inquiries from the Hottentots, and brought me back to the point whence we started. From the English traders who are located in that wild country I also received the greatest hospitality and aid, was everywhere received gladly, given the best of all they possessed, and procured the Kafir guides when I required them.

I travelled rapidly during the six days I was in the saddle. In the upper parts of the country there are of course no roads. I crossed the Great Kei river about 25 miles from its mouth, and found there that the Butterworth river is not the Coga, as laid down on some maps, but the Goa, which runs into the Great Kei about 20 miles from its mouth. The Coga is then the next river. East of this it runs near Butterworth, and falls into the sea at Mazeppa Bay.

The next river that I crossed was the Gwaninga, which runs nearly parallel to the Coga, about 20 miles N.E., and also empties itself into the sea. It is not more than 40 miles long from its source to its mouth. The Ixixini was the next. This is a larger river, and rises about 60 miles from the coast, in three sources, which join about half way down, and then flow into the ocean through one mouth, about 20 miles N.E. of the Gwaninga.

We next reached the Gnabaka. This is a much larger river than it is represented to be. It rises in the hills which formerly belonged to the great Kafir chief Hintza, who was slain in single combat by Sir Harry Smith. It has five distinct heads to the Little Gnabaka, and three to the Great Gnabaka. These flow into one course, each about 10 miles below the other: the first, which rises in the Great Gnabaka, about 85 miles from the coast; the smaller Gnabaka, about 65 miles from it. These two rivers then flow on as distinct streams, and unite just at the mouth, which is wide and open, but intersected with sandbanks. This river meets the ocean about 20 miles N.E. of the Ixixini, and about 12 miles S. of the Bashee.

Crossing the Great Gnabaka, and passing along the coast towards the Bashee, about a hundred yards up is a small bay or estuary, surrounded by cliffs of red sandstone and oolite rock, in the faces of which I found the fossils imbedded. They appear to have been subject to the action of the surf at high tides, for they are much injured; in fact hardly any parts of the original animals seem left, but merely the indentation of where they have lain. They are, notwithstanding, wonderful in dimensions, and sufficiently distinct to show pretty plainly what they have been. So far as I could conclude from what I saw of them, as well as my very limited knowledge of geology, I at once determined them as gigantic sauroid reptiles of the oolite system,* but to classify them beyond this I could not dare. I consequently made drawings separately of each, as faithfully as I could, and with as much accuracy as to colour and form as time would allow me. The measurements I obtained by getting one of my Kafir guides to stand on the upper edge of the cliff and suspend a tape line 50 feet long, and the other Kafir to hold it tight at the base of the cliff, where the different fossil extremities intersected: the marks on the tape gave me the exact length, breadth, and dimensions.

I much regretted that my time was so limited; as it was, I remained there till dark, met with a fearful thunder-storm in the mountains on my return, and did not reach the traders' station, from which I had started in the morning, until half-past 11 at night, wet through and benumbed with cold. From this I started at daylight, and rode until half-past 8 in the evening, excepting two hours during the extreme heat of the day, when I offsaddled the horses.

In returning I took a different route, and inspected much of the country. In all directions it was most lovely and luxuriant. Limestone and ironstone were in many parts seen close to the surface, and the whole landscape was undulated into long ridges of fertile hills, and these again divided by longitudinal valleys. In no part of Kafirland have I seen more vegetation and fertility, and in saying this I am not unmindful that I have always ranked Kafraria as the finest part of Southern Africa; if not indeed the most fertile and lovely locality in the known world.

I returned to Butterworth on Thursday night, and reaching the Kei, found, to my dismay, that recent rains in the mountains had brought down the torrent of this formidable river as a barrier to my farther progress. Trusting myself again, however, to my Kafir guides, I swam the river, and was nearly drowned. Thank God, I reached its furthest bank at length in safety, and after spending one more night under the canopy of heaven, I rose with the sun and reached my home at King William Town by 3 P.M. on Saturday.

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* The dimensions of the largest one were as under:—

	Feet.	In.	
Length of the head	3	0	Total length, 25 feet.
„ back	12	0	
„ tail	10	0	
Width of the head	2	0	
Length of front fins	2	4	
„ hind feet	3	0	

2. *On the Jolloffs of West Africa.* By Lieut. J. F. Napier Hewett, 72nd Highlanders.

During my sojourn in the British colony of Bathurst, on the river Gambia, Western Africa, which is chiefly inhabited by Jolloffs, I enjoyed especially favourable opportunities of observing the manners and customs of this people, which so much interested me that I determined to make an excursion into their country.

With this intention I started from Fort Bullen, on the N. bank of the river, passed the town of Yassaou, situated in the district ceded to Britain by the King of Barra, and entering the adjacent country of Barra, inhabited by Mandingoes, travelled some miles until I arrived at a walled but ruined town (Whydah), which, having fallen under the displeasure of Demba Sego, the warlike king of the country, had been by him destroyed.

Soon afterwards I reached Berending, the capital, and the king having provided me with horses, accompanied by one of his sons, I crossed the border, and, passing several towns and villages, came to Bákándik.

Here I made another stage, and proceeding arrived at length in the Jolloff country, Saulaem, and shortly afterwards at Woioutaou, probably about midway between the French settlements at St. Louis, Senegal, and the British colony on the Gambia; but, as I possessed no instruments and took no observations, I can only speak from opinion, and am unable to assign the particular locality of any of the towns; and, as the vicissitudes of military life have caused the loss both of my journal and of the rough map I drew out, I cannot speak with much certainty; but the greater part of the paper now submitted was compiled on the spot from that journal.

The country bordering on the north bank of the river Senegal is inhabited by wandering Arabs, Moors of Ludamar, and within the inclosure between that river and the Gambia principally by a race of Mahomedan blacks, who speak an Arabic dialect. They are called Jolloffs; are one of the most powerful and extensive of the north-western tribes; and are a fine-looking, intelligent, handsome race of people, as unlike the American and West Indian negro of every-day life as the Englishman of the present age is like his forefather, the rude woad-stained Briton.

The features of the men of this race being devoid of the slightest trace of the negro cast of countenance, and being regular and well-formed, are very comely—so much so, that I have seen Jolloffs whose physiognomy, if white, or merely swarthy, instead of black, jet black, would be esteemed models of manly beauty.

They are all of tall, symmetrical stature, having a dignified, sedate presence, and do not possess the negro characteristics of large hands and unwieldy feet, but remarkably the reverse.

Their notable peculiarity is their hair, which appears to be of greater length than the wool of most negroes, and is twisted and tortured into little cylindrical ringlets about the thickness of three straws, and from five to six inches in length.

Hence it might be imagined they are Arabs, but, unlike that race, they live a settled life, dwell in established towns, cultivate lands, feed flocks, and engage in a regular system of traffic.

Taking into consideration their religion, the length of their hair, their other physical characteristics, and the similarity of these to those of the Arabs and the most stalwart tribes of the Hindostan peninsula, I am of opinion that the Jolloff race cannot be classed with the negro family, but pertain rather to the Caucasian, and must have sprung from an Arab horde that has abandoned a wandering life. Yet, in the first place, it must be remembered that the Jolloffs are quite jet black; and, secondly, I must premise that they have, as I believe, become Mahomedan comparatively lately; but, be their origin what it may, they are negroes to all intents and purposes, and occupy a large tract of country.

The Jolloff country is divided into three or more independent kingdoms, which frequently war with one another; and of which states the principal are Danaar or Senegal, Saulaem, and Ballagh or Baa. The chief towns of Danaar are Bowael and Kadjo; of Saulaem, which lies to the southward of Danaar, Saulaem and Woioutaou, the latter about half way to Gambia; and Ballagh or Baa, situated on the north bank of the river Gambia, but some distance up the stream.

Each kingdom is governed by a hereditary monarch, and each city by a hereditary magistrate or alcade, who is responsible to the king for the conduct of the townspeople, and accountable for the apprehension of all malefactors who may be supposed to have sought asylum within the walls.

The chiefs of Danaar and Saulaem maintain regular standing armies, and are, I believe, the only negro potentates who do so.

The King of Danaar is named Djumael, whose army, said to number 12,000, chiefly cavalry, is by no means to be despised, as the French at St. Louis, Senegal, and Goree tacitly acknowledge, by declining to accept the frequent challenges which Djumael offers, to quit their fortresses, marshal their forces on the plain, and measure their strength in fair fight with his army.

The religion, habits, laws, customs, country, towns, and pursuits of each and all of the Jolloff kingdoms being precisely the same, I speak not of the one particular kingdom I visited, but of the whole race and country.

The greater part of the expanse is perfectly flat—one vast sandy level, studded with groves of palms, stately trees, noble forests, tangled jungles, and intersected by sluggish creeks, whose swampy margin is overrun with the baleful, miasma-exhaling, but beautiful mangrove. The soil, though sandy, is very fertile, and, being generally cultivated, produces vast quantities of grain, and the ground-nut, which plant, putting forth its clove-like leaves after the rainy season, clothes the plain in a mantle of brightest emerald, and growing exactly like and about the height of clover, overrunning the ground and interlacing its sprays, makes the surface of the earth resemble a soft carpet. During the dry season the plain, with its vegetation yellowed by the burning sun, is of a rich golden hue, wearing the appearance of a landscape of chased gold, and the bright green and dense dark foliage of the trees contrasts beautifully with the brilliant tint of the expanse.

A remarkable feature is the number and size of the ant-hillocks, the tenements of the termites, which are conical, sometimes six feet in height, and so firmly constructed as to be almost capable of resisting the application of a pickaxe.

The principal trees I have noticed are the palm; the towering silk-cotton-tree, whose trunk is like an inverted closed umbrella, and which would overshadow our most gigantic oak; the ash-like mahogany; the dense umbrageous caoutchouc; the naked spectre-like monkey-bread; the wild tamarind; and a peculiar tree, and also bush which grows six feet in height, the extremities of the twigs of which appear at a distance to be on fire. This remarkable appearance in both is caused by their putting forth bright scarlet flowers at the end of each twig, while the bush itself is devoid of leaves.

The towns and villages are fenced round with a triple stockade, eight or ten feet high, made of the trunks and limbs of trees, planted perpendicularly, irregular at the crest, and therefore impracticable to escalade by ladders.

The streets are about three feet wide, having either side lined by mats, or bamboo hurdles, seven feet high, and, as the walls of the dwellings are but three or four feet high, the wayfarer sees nothing but roofs, which, being *thatched*, lofty, generally circular, and finished off at the apex with an ornament, lend to the place the appearance of an extensive rickyard, until the traveller, arriving at a square, beholds the tenements unmasked.

The houses are built of clay burnt hard by the sun, and are very neat in aspect, and consist of a circular wall, built of mud, two to four feet high, pierced with ornamented loop-holes as windows, and a doorless entrance, the lintel of which is sometimes modelled into pillars, which last, like all primitive ornamental architecture, is imitative of the prevailing vegetable feature of the country, in this instance the palm. Within this inclosure is another and a higher circular wall, like a tower, having a lofty doorway, and the rafters for the roof are laid resting on this wall and on the lower one; these are thatched over, and then the hut is finished off as before described. The doorway of the inner chamber opens in the opposite direction to the low entrance, and this apartment, notwithstanding its utter want of ventilation, is that of the master and his favourite sultana, while the exterior gallery is the dormitory of the slaves, domestics, and children, and is also the kitchen, where in the evenings the fires are kindled against the inner wall, which is thus burnt like brick. Each house possesses a rectangular inclosed yard, in which is a shed having a mat on the ground, where the master performs his devotions and religious ablutions, and the sides of these inclosures form the previously-mentioned linings to the streets. I may here remark that each one of these huts is a small castle in itself, and is so admirably adapted for defence, that one man might evade his pursuer or defend it some time against numerous assailants.

The squares generally contain, besides other dwellings, the mosque; the school, over which a Marabou presides, expounding the Koran, teaching the youth, and preparing some of them for the priesthood; and the residence of the Marabou, where may be seen the Jolloff books, which consist of wooden tablets whitened and superscribed with Arabic characters.

The principal square is distinguished by a lofty tree in the centre, and is called the "penang" or market-place, and here the caravanserai is situated, the horses and camels belonging to halted caravans picketed, palavers held, and, beneath the spreading branches of the tree, the women meet to dance, the men to hold festival, and the children assemble to celebrate certain Olympic games.

The granaries, wherein they deposit their ground-nuts, &c. are cane edifices erected on posts of palm-trunks, and the doors are merely bolted; while to the bolt is affixed a gree-gree or charm, which, the people being afraid to touch lest some mischief should befal them, serves as a lock.

The Jolloff cattle are very similar to the small short-horned Highland breed; but the sheep are the most remarkable animals, being long-legged, as tall as a small calf, marked piebald, yellow, brown, or black, and long-tailed. At first I mistook them for calves, and, as I said before, I do not recollect ever having seen them gathered in flocks. The horses are small, symmetrical, spirited, and tireless; but, being ridden with cruelly sharp bits, are not pleasant to the hand of an Englishman, and certainly are most incommodiously accoutred.

The Jolloffs are very superstitious, and are covered with amulets consisting of beads; pieces of cut, embossed, stamped, and enamelled leather, in number and beauty proportionate to the wearer's wealth; and snake-like necklaces of polished leather, in quantity and weight sufficient to bend the neck. The beads are either fancy beads or the Mahomedan rosary, and the others, amulets both decorative and useful, are called gree-grees. They consist of illuminated extracts from the Koran, enveloped in leather and beautifully ornamented—sometimes twenty on a string, and sometimes the whole Koran itself. These talismen are supposed to defend the bearer from certain terrestrial evils; to possess curative power; and even to ensure a passport to, and safe reception in Paradise.

These charms vary in value according to the price paid for them, and this depends upon the degree of fame for sanctity the transcriber of the enclosed verse enjoys. Again, the value increases as the Marabou's sanctity increases; and *vice versâ*. The production of a youthful saint might only avail against rheumatism or lesser maladies; thus a man afflicted with that disease will so load the part affected as to impede the free use of the limb; and the little children rolling in the sand, though utterly naked, are laden with strings of cheap gree-grees, sometimes even crossed over the body like the belts of a soldier, protecting, as it is believed, the infant from the bites of insects, and lesser evils incidental to childhood. The people do not object to part with a gree-gree for a consideration; and the case, if opened, will be found to enclose a MS. exceedingly skilfully executed in illuminated Arabic characters. Prompted by curiosity, I uncased a crescent-shaped amulet. The exterior covering was of leather, very neatly sewn, enveloping a goat's horn, the orifice of which was sealed by what had been an aromatic composition; beneath which coating lay two pages (superscribed with texts from the Koran), yellow with time and worm-drilled—two pages of a printed English tract or sermon dated thirty years back! Little did the author and distributor anticipate the use to which the tract would be devoted.

The Jolloff religion is a mild form of Moslem, devoid of the intolerant bigotry that disgraces the creed of their neighbours the Moors of Ludamar; wherefore, few but the Marabous scruple to drink intoxicating liquors, and few entertain the orthodox animosity to Christians.

Notwithstanding the credulous superstition of the race, the Jolloff worship is pure Mahomedan, unsullied by any admixture of idolatry or paganism, but inculcating rigid observance of the various feasts, fasts, and ablutions, and proselytisation both by sword and by missionaries.

At Bathurst I met a Moor,—a bishop, I suppose,—who, surrounded by disciples, was on his travels, confirming and strengthening the faith of the wavering, and adding new converts to his religion. The Mahomedan religion consequently increases rapidly among the Kafir (infidel) tribes, while, from the comparatively attractive nature of that creed, few belonging to it are converted to Christianity—excepting the females, who, when dwelling in European colonies, and finding that in the Christian creed they enjoy equal rights with the men, are often converted.

The Jolloff is a musical race, possessing numerous musical instruments; and a synod of bards, which, I understand, confers degrees in music on the minstrels, one of whom, attached to the train of each eminent man, extols his patron's greatness, generosity, and deeds in arms, and, relating his pedigree, and eulogising each distinguished warrior who passes in review, stimulates the auditory to emulate the fame of those celebrated. The others are the historians of the country, who, roaming from place to place, from festival to funeral, celebrate whoever and whatever desired; reciting the history, martial achievements, and ancient traditions of the people; and, when occasion demands, inciting the populace, by heroic strains, to maintain the warlike renown of their sires.

Some of the airs are simple and pretty, others are wild and undistinguishable; and one of the most popular is almost the same as the Persian national air, which is called by the Hindoos "Taza-ba-Taza."

The males dress, as do the Arabs, in a loose toga-like garment of striped and coloured homespun cloth, and wear on their heads either an embroidered white cap, something similar to a Glengarry bonnet, or a turban formed of a white wrapper, which, in the evening and morning when the atmosphere is chilly, is worn like a plaid, and as a turban at midday, when the head requires protection from the burning sun. Their feet are shod with red sandals, the straps of which are neatly sewn and embroidered, and they are armed with swords and daggers encased in handsome red leather sheaths, stamped, embroidered, and enamelled; with spears of curious workmanship, and muskets. The chiefs possess robes of coloured cloth, embroidered with gold, and their everyday garments are well and tastefully embroidered with coloured cotton or silk.

They are armed with muskets, with curiously wrought spears, swords, and daggers; and their sandals, bridles, and saddles, are generally tastefully decorated. The pieces are procured from the French merchants at Senegal and the English of Gambia, the silk for embroidery from the Moors, and the iron weapons and leathern articles they either fashion themselves or procure from their neighbours the Mandingoes, a race peculiarly skilful in such work; in barter for gold and silver trinkets, in which the Jolloffs much delight, and which appear to constitute their chief wealth. These leathern articles are also given to the Jolloffs in payment for working rough gold, as in the goldsmith's trade they much excel; and the cunning with which they fashion the precious metals, even with their clumsy tools, is wonderful, almost rivalling the celebrated Maltese work in ingenuity and minuteness.

All business is conducted through the alcade of a town, who, on application being made, orders his men to procure whatever may be wanted; receives whatever payment he himself has fixed; discharges the claim of the artisan, and of course reserves a commission for himself. Regular trading caravans are received and dispatched to all quarters—to St. Louis and Mogador, to the Arabs, to the Mandingoes, westward and southward, and even to the banks of the Gambia. Owing, however, to the number of petty independent townships which, ever at war with one another, intercept and plunder these caravans laden with slaves, tobacco, baft, cloth, gold, and ivory, on the journey to or from a hostile tribe—less frequently to the last than to the other places—wars are too often declared on a frivolous pretext, either with the Mandingoes or with the Kafir (infidel) tribes, for the purpose of collecting slaves; but now that the slave-trade of the Senegal and Gambia rivers has been abolished, these raids are undertaken with the ultimate view of selling to the Moors the unfortunate prisoners captured. These predatory forays among the infidels have another object, viz., the conversion—in obedience to the injunctions of the Koran—by fire and sword, to the Moslem religion: thus, as interest is made to accord with duty, and those who fall in these crusades are preferred in Paradise above all others, the wars are frequent, and the tribes gathered to the fold of the "true believers" increase daily.

The Jolloff people are mild, hospitable, possessing no sanguinary laws; and, in hope of opening a trade, always welcome a "tobaubo," or white man, towards whom, notwithstanding his creed—especially repugnant to Mussulmans—they are invariably gentle, accommodating, and inoffensive. A European may traverse their country in perfect safety, and even by himself, if he possess a knowledge of Arabic, and provides himself with a few colar-nuts for distribution; as the presentation and acceptance of a colar seals a friendly compact, the breach of which would be esteemed a crime of the blackest dye. The colar is a bitter pink kernel, brought from Sierra Leone. It is an excellent tonic, and is so preventive of thirst, that a Jolloff having one in his mouth will walk 30 miles without drinking water; and on this account, in a country where fresh water is only procurable at the city wells, the colar must be highly prized.

In conclusion: the recollection of the journey my mind now retains is that of galloping over an immense unenclosed plain, threading tangled jungles, and passing through dark forests; of seeing expanses of tall grass, eight or nine feet high, which seemed to bar the way, but when approached, a small opening, a dark green cave through which the path winds, would appear. I would dart in, the grass waved and whispered as it closed around me, and my knees brushed the stems, arched over my head and obscuring the sky from my view; but wild as was the scene, it is one of indescribable beauty, and having been once presented to the eye, has ever after an irresistible fascination and attraction.

3. *Result of* DR. VOGEL'S *Observations for Latitude and Longitude, January to August*, 1855.

Place.	Latitude.			Longitude.			Remarks.
	°	′	″	°	′	″	
Kuka	12	55	33 N.	13	24	00 E.	The Latitude from Equal Altitudes.
Gujeba	11	32	00 N.	11	38	36 E.	
Gabbei	11	04	30 N.	11	21	15 E.	
Gombé	10	48	42 N.	10	20	55 E.	
Yakóba	10	20	10 N.	9	31	45 E.	
Muri	9	12	00 N.	10	32	33 E.	
Tindang	9	07	42 N.	10	52	44 E.	
Dalhaji	10	32	20 N.	8	23	08 E.	
Salia	11	04	46 N.	7	23	10 E.	
Bebeji (Kano) ..	11	35	30 N.	8	06	25 E.	This place is not so well determined in Longitude as the preceding.

N.B.—The Latitudes are deduced from Observations "*off the Meridian*," and are computed by Dr. Inman's method of Cir-cum-Meridian Altitudes.

The Longitudes are from Meridian Distances, by one chronometer (Molyneaux, No. 3147). Judging from its uniform rate, it must have been very carefully attended to in travelling from place to place.

Kuka is assumed to be in Longitude 13° 24′ E., the other places measured from it.

C. GEORGE, R.N.,
Map Department, R. G. S.

October, 1857.

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